The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXIII. No. 599 DECEMBER 20, 1930 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0

Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.*

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CHRISTMAS HOLIDAYS

The offices of "The Chemical Age" will be closed for the Christmas Holidays from 4 p.m. on Wednesday, December 24, to 9.30 a.m. on Monday, December 29.

Next week's issue, which will be the Annual Review number, will go to press two days earlier than usual, and the last day for receipt of copy will be Tuesday, instead of Thursday.

Our Annual Review Number

NEXT week will be published the twelfth consecutive Annual Review Number of THE CHEMICAL AGE. We may claim to have been the first chemical journal in this country to give the industry an authoritative and complete record of its main developments at the end of each year, and though we have witnessed a few attempts at imitation, some of them coming as near as they can in titles and other respects to our original idea, THE CHEMICAL AGE Annual Review remains the standard annual record of the industry's progress in this country. Next week's issue will be as comprehensive as any of its predecessors, and we have again to express to our numerous contributors our sincere appreciation of their continued help in this effort.

In addition to a specially compiled record of the proceedings of the chemical and allied societies, the issue will contain a group of exceptionally important articles by well-known authorities. These include a survey of the principal chemical developments of the year by Brig.-Gen. Sir William Alexander, M.P.; a detailed review of British chemical industry, by J. Davidson Pratt, general manager of the Association of British Chemical Manufacturers; "The Nitrogen Industry in 1930," by Dr. E. B. Maxted; "The Dyestuffs Act—Ten Years and After," by W. J. U. Woolcock, Chairman of the Dyestuffs Industry Development Committee; "Progress of the British Gas Industry," by Sir David Milne-Watson; "Progress in the Heavy Chemical Industry," by P. Parrish; a review of the year's chemical inventions, by our Patents Correspondent; a year's developments in the solvents industry; colour users and the dyestuffs situation; the British synthetic fertiliser industry; and chemical researches undertaken by the Department of Scientific and Industrial Research. As this issue is generally soon sold out and copies cannot be replaced, it is advisable for all who are not regular subscribers to secure the issue by ordering in advance.

The Dyestuffs See-Saw

ABOUT a fortnight ago the House of Commons, by a majority of 30, decided to exclude the Dyestuffs Act from the Expiring Laws Continuance Bill, in other words, to allow it to lapse on January 14 next. On Monday of this week the House of Lords reversed this decision by a majority of 87 to 14. On Wednesday evening the Lords' amendment in favour of continuing the Act for a further period of twelve months came up for discussion in the House of Commons and after a vigorous debate the Lords' amendment was defeated by 244 to 238, that is, by six votes. In this cheerful way do the professional politicians who rule the country play with the fate of industries of vital importance to the nation.

It is clear that the Government intend, if they can, to kill the Dyestuffs Act. It is equally clear that, in their efforts to do this, they have gone a long way already toward killing themselves, so far at least as scientific opinion in the country is concerned. Major A. G. Church, himself a supporter of the Government, stated truly that the scientific opinion of the whole of the scientific world was against the lapsing of the Act; by their attitude the Government have completely alienated the sympathy of scientific interests throughout the country. It is not merely that they

are blindly following a political formula; what impresses and alarms one even more is their callous attitude towards expert advice and their hopeless failure to appreciate what research is and what it means to national industry and national interests. Here is Mr. Tom Shaw, when the experts of his own department tell him that if research cannot be maintained through the dyestuffs industry, something comparable must be provided, retorting in his best mandarin manner, "I must be responsible for policy in my Department. I say to them, If you want your chemical research, pay for it. Don't do it at the expense of Lancashire." To people who have given some study to these matters, such an attitude is not merely callous but fatuous, and such people will look forward hopefully to the first opportunity of relieving Mr. Shaw and his like-minded colleagues of powers for the exercise of which they are advertising their incompetence.

Even now the end has not been reached. If the Commons and the Lords adhere to their respective attitudes the Expiring Laws Continuance Bill cannot be enacted and such measures as the Rent Restriction Act and the Aliens Act will cease to operate. Meanwhile the politicians will go on enjoying their game of see-saw at the national expense.

Sulphate of Ammonia Report

THE annual report for 1929-30 of the British Sulphate of Ammonia Federation, Ltd., is less detailed than some of the reports in recent years. The outstanding feature of it is that while production has increased at the rate of about 3 per cent., consumption has increased at the rate of 4½ per cent., following on increases for the years 1927-28 and 1928-29 of 25 and 14 per cent. respectively.

The drop in the increase of consumption is obviously due to the depression in the agricultural industry, for, although as the report points out, in times of adversity farmers should use more nitrogen in order to increase their yields and lower their costs of production, they prefer instead to limit their purchases to the amount of their available cash. Chilean nitrate showed a decline in consumption of 13½ per cent., while other forms of nitrogen secured an increase of 10½ per cent. The main notable increases in consumption took place in the United States, Spain and Portugal, China, and Japan.

In view of the fall in the prices of agricultural produce and the unfavourable financial position of farmers in many countries, it is considered doubtful whether any considerable increase in the consumption of nitrogen can be looked for during the year 1930-31. It has been emphasised again and again, particularly by the producers of synthetic nitrogen, that the capacity for the profitable use of nitrogen compounds is almost without limit. That remains strictly true, but for market purposes it is qualified by the users' refusal to employ them to the fullest capacity, and an enormous amount of education and propaganda must be expended before the possibility has any chance of being realised.

In the face of the check to consumption, it would obviously have been folly to keep on producing to the full capacity of the plant, and the fact that production has not outstripped consumption is due to a prudent understanding among all the producing interests not to flood and ruin the market with unwanted products.

Toward the end of the fertiliser year 1929-30 a number of new synthetic plants came into operation, and there was considerable pressure to sell in those markets which are capable of absorbing nitrogen in the summer months. If indiscriminate selling had been allowed to persist a general break in nitrogen prices would undoubtedly have occurred. The market was saved from this by the one year's agreement that was reached in the summer between the organised producing groups in Belgium, Czechoslovakia, France, Germany, Great Britain, Holland, Italy, Norway and Poland.

This agreement led to an arrangement with the Chilean government and producers, and in the words of the report, "a breathing space has thus been secured to nitrogen producers which will be used to endeavour to secure a more permanent basis of co-operation for the future."

On May 31 last the Federation consisted of 400 members, but of these 93 had permanently ceased to produce, and have not renewed their agreements. Of the producing members 48 have not renewed their agreements. The annual production of these members amounted in 1929 to 12,753 tons. This figure represents less than 2 per cent. of the total production of the Federation.

"Counted Out"

THE last few days have seen a marked development of public interest in national economy. On all sides the cry now goes up for drastic retrenchment. Even the ill-fated motion on economy, "counted out" in the House of Commons last week, has served as a powerful stimulant to responsible electors. When Parliament cannot muster forty members ready to show an interest in the most vital subject of the day, it is time for thoughtful citizens to be stirring. It may justly be claimed that *Account Rendered* (1900-1930), Sir Ernest Benn's new book, has played an outstanding part in sounding the alarm and inspiring the present movement.

From time to time a book is written that fills exactly the need and temper of the times. Such a book is *Account Rendered*. It has been welcomed with a gathering chorus of praise in the short time that has elapsed since its publication, and has been hailed with emphatic cordiality by the more influential part of the daily and weekly Press. The claim has been made for *Account Rendered* that it would become the text book of the national economy movement. That movement is growing fast, and so far the claim for the book has been justified.

Books Received

A SCHOOL COURSE OF CHEMISTRY. By J. R. Partington. London: Macmillan and Co., Ltd., Pp. 388. 4s. 6d.

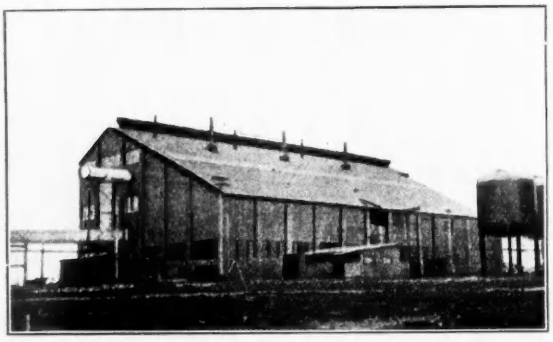
THE MINERAL INDUSTRY OF THE BRITISH EMPIRE AND FOREIGN COUNTRIES. Imperial Institute. London: H.M. Stationery Office. Pp. 371. 5s. 6d.

Contact Acid and Nitre Cake Manufacture

Description of Two New Canadian Plants

The first plant in Canada designed and constructed for the direct production of nitre cake from natural sodium sulphate was put into operation by Canadian Industries, Ltd., at Copper Cliff, near Sudbury, Ontario, in July, and has reached a high state of efficiency. An account of this plant and of the manufacture of sulphuric acid from the converter gas of the smelter of the neighbouring International Nickel Co., is contained in the November issue of "Canadian Chemistry and Metallurgy," from which the following extracts are taken.

UNTIL recently it was difficult to secure a sale for nitre cake. It was a by-product of hydrochloric and nitric acid production when these chemicals were produced from their salts. Ammonia oxidation and synthetic hydrochloric have changed this situation, although the uses of nitre cake are few, as far as tonnage



ACID PLANT, SHOWING GAS LINE FROM THE SMELTER AND GENERAL CONSTRUCTION OF BUILDINGS.

outlets are concerned. A particular set of conditions was necessary in order to make Copper Cliff the logical site for a nitre cake plant. The International Nickel Company propose to concentrate their metallurgical process of separating nickel-copper at this point, discontinuing this division of their plant at Port Colborne. Nitre cake then will be used where it is produced.

The actual process of manufacturing the acid sulphate, while complicated enough on a plant scale, should not overshadow in any way the importance of the two materials that are brought together and the difficulties involved in their preparation.

The sodium sulphate used at this plant is secured from the Horse Shoe Mining Company at Horse Shoe Lake, Sask. After harvesting from the Lake, the natural sulphate is dehydrated by a process of drum drying, followed by steam drying, the latter also being a drum operation. The product shipped is practically anhydrous, and runs 90 per cent. sodium sulphate.

Sulphuric Acid from Smelter Gas

The sulphuric acid is derived from the converter gas of the smelter of the International Nickel Company, and the new plant at Copper Cliff is a striking example of good chemical engineering. In fact, it is a question if more thought, skill and care have ever previously been put into a works of this kind. The acid production is 150 tons per day, about one-half going into the nitre cake plant, and the remainder reaching markets in Ontario and Quebec.

The history of acid production in the Sudbury district goes back only to 1925, when Dr. C. V. Corless, former manager of the smelter and interests of the Mond Nickel Company in Canada, agreed, on behalf of his directors in England, to permit Mr. W. H. De Blois to tackle the problem of making sulphuric acid from the sulphur dioxide passing out up the smoke stack.

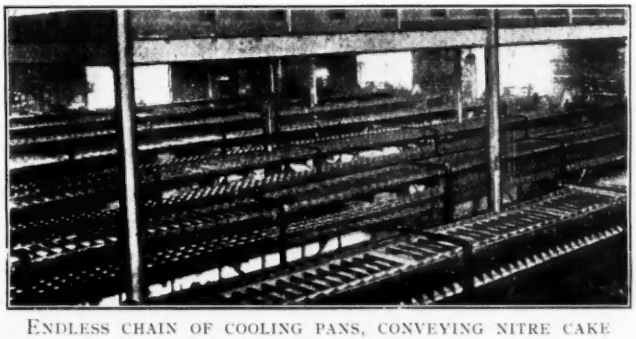
Perhaps the essential difficulty met with and overcome was the elimination of the fine dust from the gas. These particles, almost colloidal in size, could not be scrubbed out. In quantity they amounted to very little, but their effect was serious. Finally, after experimental work with the Western Precipitation Company, an adaption of the Cottrell patents and systems was secured, which separated, by electrical precipitation, these exceedingly fine particles which amounted to only a few pounds in a great many tons of sulphur dioxide, but which caused most of the trouble. One of the direct results of this work is an acid and nitre cake plant costing $1,500,000, equipped with every device to produce mechanical perfection.

Acid Plant Construction

The acid plant proper is a brick and steel building, 216 ft. long, 115 ft. wide and 75 ft. high, with one end constructed for removal and an overhead crane to handle all plant during installation or expansion as required. The gas comes from the smelter through an insulated steel flue approximately 1,000 ft. in length. An extension of this flue runs the length of the building, and can be tapped off as required to each unit. In general, one side of the building is retained for dry operation and the synthesis equipment, and the other for cooling and wet operations. The gas, considering one unit of the three constructed, enters two scrubbing towers, made of lead. The lead work throughout is of unusual quality and design. The scrubbing towers contain sprays of weak acid, which removes the bulk of the dust and cools the gas. The gas is now down to 100° Fahr., and the remaining dust is taken out in the Cottrell apparatus. Moisture is removed by passing through strong 90 per cent. sulphuric.

When the gas is ready to convert it passes through a blower on the pure and dry side of the system, following which it is heated to 400° C., at which temperature it is ready for conversion. The converters contain either vanadium or platinum catalyst (both are used). The heat of reaction is sufficient to pre-heat the gas coming in. The gas passes through two converters, as the temperature rises too fast for the reaction to be complete in one. The temperature must remain fairly fixed for efficient conversion. By the time the SO_3 is through the last heat exchanger it is cooled down ready for absorption. The SO_3 is absorbed finally in 98 per cent. sulphuric acid, which is afterwards diluted to any desired strength. Finally the flue gases pass off with no more than 0·2 per cent. SO_2 remaining. The original gas contained about 6 per cent. SO_2.

The Cottrell treaters are a series of pipes with electrode wires in the centre of each pipe. The gases pass through the pipes, and the solid particles are carried to the walls of the



ENDLESS CHAIN OF COOLING PANS, CONVEYING NITRE CAKE FROM REACTION VESSELS.

tubes as they become charged with the current, which is maintained at 50,000 volts. The amount of current used is, of course, very small. The pumps used for acid are in general of the LeBour type. The vessels for storage are of steel construction, with hemispherical bottoms.

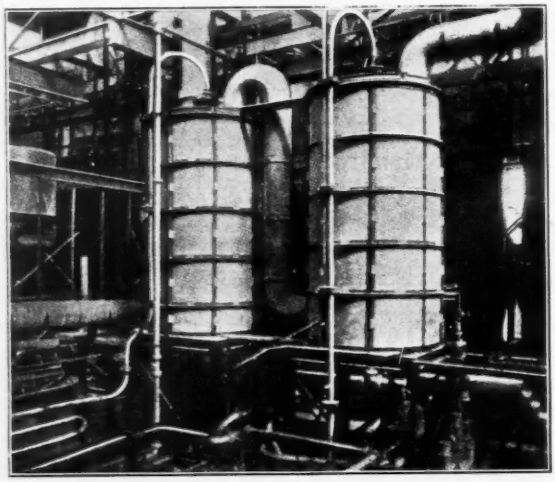
A very interesting special feature is to be found in the rectifier room. Here, besides safety devices of the latest design, is a special attachment which makes it impossible for interference with local radio sets to occur. The discs

on the rectifiers are made of Bakelite. The gases formed by the sparks passing through the air are neutralised by ammonia vapour from a carboy left in the room for that purpose.

The concentrated acid is finally brought down to 66° Beaumé by passing through a series of Duriron tanks, where it is diluted to the required amount.

Nitre Cake Manufacture

Fifty per cent. of the acid made at the present time at Copper Cliff is used immediately to produce nitre cake. Four 1,000-ton tanks act as storage for the plant. The anhydrous sodium sulphate from Horse Shoe Lake, Sask., is delivered from cars to a storage building with a capacity of 8,000 tons. The sodium sulphate arrives as a gray salt, somewhat lumpy, but a high percentage will pass through a coarse screen. From the storage building, which is designed for the particular purpose, being broad based and relatively low, the sodium sulphate is elevated to storage and distribution bins situated above the reaction furnaces or retorts. The sulphate, after further screening, is passed through a screw conveyor to a mixing chamber of the conveyor type, where the sulphate and 93 per cent. acid are mixed to a thick paste continuously. From the mixing trough the acid and sulphate is dropped to a retort, oil fired, where the nitre cake is formed. The retorts used are circular and are supported on brick surrounded by a



VIEW OF ACID SCRUBBERS AND GENERAL APPEARANCE OF SYSTEM OF ACID LINES AND OTHER PIPING.

steel frame and brick walls. These retorts are similar to those used in nitric acid manufacture, but have been re-designed for this purpose.

The mixture from the screw conveying mixing device above is discharged into the retort, and by the time the material has reached the outlet, the reaction is complete and the mixing sufficient. The molten sodium acid sulphate overflows continuously through an opening in the side of the retort, and is caught in a series of pans attached to a moving chain. This conveyor system passes away from the retort at a rate of 120 ft. per hour so that the nitre cake has a chance to set and cool in the pans of the conveyor. The cooling is promoted by passing water under the pans on the conveyor. The slow conveyor finally discharges the nitre cake into a second conveyor passing at right angles and moving at such a rate as to take care of the discharge from nine units of the type described above. The pans are shaped so that they form a cake of sodium acid sulphate about 2 ft. long by 4 in. wide, rather easily broken into three parts during the discharge because the pan itself has two " V "-shaped divisions in it. The nitre cake is quite dark, almost black, due to impurities. The quality is suitable for the purpose of the International Nickel refining operations, and the solidity and shape of the cakes or blocks have been determined with this in mind.

A quite interesting point is the spraying of the pans with oil so that the cakes will drop out readily when cool. An automatic hammer strikes each pan as it is turning on the cool end of the conveyor. This releases the cake. The labour involved has been reduced to a minimum, and under proper working conditions need not be heavy. The mixers, the discharge holes for the hot nitre cake, and the discharge of the pans on the endless conveyors, need attention from time to time, but the process is essentially continuous and without manual labour of a heavy type.

In fact, the two plants, both acid and nitre cake, might conceivably be operated by not more than ten people, assuming normal conditions.

One of the first mines to be opened up in the Sudbury District was the Copper Cliff mine of the International Nickel Co. The ore from this mine originally was worked solely for its copper content. The fact that the ore contained nickel as well as copper was not suspected until the first shipment of matte was received at the refinery. When the presence of nickel was discovered, the refinery was confronted with the problem of separating the two metals. At that time, there was no known method of making the separation on a commercial scale, and an intensive series of experiments was undertaken. It was found eventually that by smelting a copper nickel matte in a reducing atmosphere with sodium acid sulphate (or nitre cake), a marked separation of the two metals was obtained. The discovery finally was worked out in a practical way, and forms the basis of the so-called Oxford process as it is used to-day.

The Evolution of Coal

Address to East of Scotland Chemists

THE evolution of coal formed the subject of an address to a joint meeting of the East of Scotland branches of the Chemical Society and the Society of Chemical Industry by Professor Henry Briggs, Hood Professor of Mining at Edinburgh University, at Edinburgh on Tuesday, December 9.

His observations, said Professor Briggs, led him to the opinion that the gradual change taking place in coal was spontaneous; it could be accelerated by external agencies, and could be hindered or even stopped; but normally it went on automatically. Using evidence brought forward by Professor Hickling and others, he showed how, in the earliest stages of the process, lignite developed from peat mainly by the expulsion of water; how lignite changed to bituminous coal by emitting carbon dioxide as the principal product, along with other gases; and how bituminous coal was transformed to anthracite mainly by the expulsion of methane—the fire-damp of the miner. Coal seams existed in South Wales which varied in rank from the bituminous, through the semi-bituminous and semi-anthracite phases, to anthracite itself, and, using one such seam as example, the Professor showed that it was possible to calculate the composition of the fire-damp generated by the coal at each stage. Instances were given of the continuous emission from coal seams of fire-damp in great volumes, one " blower " or natural vent of gas at a South Wales colliery, still going as strongly as ever, having discharged about 6,500 tons of nearly pure methane since its discovery fifty years ago.

Sudden Discharge of Gas

Though the maturer coals generally produced fire-damp, there were a few exceptions. In the hard coalfield in South France, for example, the gas emitted was almost pure carbon dioxide, and in that region the effect was apt to be of an unpleasantly dramatic kind. Great volumes—sometimes several millions of cubic feet—would be suddenly discharged. On one occasion an irruption of this kind dislodged 4,000 tons of fine coal, of which 1,000 tons were shot up the mine shaft. The workings were flooded with carbon dioxide, and the gas poured out in poisonous volume over the ground.

Certain influences had the power of retarding or inhibiting the maturing of coal. Perhaps the most striking example of arrested development was that of lignite in the Moscow coalfield. Though actually older than our own coals, this lignite had resolutely refused to develop. It was a Peter Pan among coals—a coal, so to speak, without a pituitary gland. Retarded development due, the lecturer suggested, to the effect of excessive ash content, was revealed in the instance of certain impure bands of coal lying on top of anthracite seams. Though adjacent to each other, the dirty band might contain twice as much volatile matter as the purer anthracite below, and was, in fact, an altogether less mature type of coal. The subject of retarding influences offered what was all too rare nowadays—an untouched field for research.

Parliament and the Dyestuffs Act

Government's Narrow Majority in Opposing Renewal

The fate of the Dyestuffs Act has become the leading political question of the day, and on Wednesday night was the means of reducing the Government majority to six. On Monday the House of Lords passed an amendment to the Expiring Laws Continuance Bill to continue the Dyestuffs (Import Regulation) Act until December 31, 1931, but the Government has disagreed with the amendment, and only just carried its way in the Commons.

Moving to disagree with the Lords' amendment to the Expiring Laws Continuance Bill in the House of Commons on Wednesday, Mr. W. Graham recalled that the Commons, by a majority of 30, decided to allow the Act to lapse on January 14 next. He had read the debate in the House of Lords with very great care, and the chief argument used there in favour of continuing the Act was that an opportunity would be provided for an inquiry into the position of the industry and its repercussions on other industries, notably the textile trades. That would have been an impressive argument had there not been a very full inquiry already. No word was said in that debate of the prolonged review of the Dyestuffs Industry Development Committee, and the conclusion which it reached, in so far as it was was a conclusion. But so far from being content with that very full review, he addressed another inquiry to the Committee in the hope that they would be able to give some direction to the Government. That Committee was representative of both dye manufacturers and dye users. On the second occasion they were unable to give any clear direction to the Government, but they made it perfectly plain that the industry had been very firmly established, and that there was no doubt that a considerable price had been paid by the textile industry. He thought one could say on that document that a case had been established for the disappearance of the legislation, so that there was no validity in the plea in the House of Lords that there had not been a very full and very impartial review of the whole problem.

Sir P. Cunliffe Lister

Sir Philip Cunliffe-Lister (C., Hendon) said that in more than one quarter of the House the speech of the President of the Board of Trade would have been heard with very sincere regret. Without hesitation he would say that if a vote on this matter were taken, without party considerations, there would be a clear majority in the House for the continuation of the Act. The House had been told that the textile dye users were unquestionably opposed to the Act. That was not in any near relation to the truth. The pamphlet against the Act had appended to it twenty names. The pamphlet which urged the continuance of the Act was signed by 227 firms who were dye users.

"I do not agree," he continued, "that the risk of dumping is not very real. Already since the last debate in this House several of the English dye-makers have been approached by foreign dye-makers and asked to discontinue the manufacture of dyes and sell foreign dyes as agents. It would pay British dye-makers to take that offer if this Act is repealed. That would mean turning men out of work. It would not affect the wages of a single man in Lancashire, until there happened what happened before, and the Germans got a monopoly. The price of dyes would then go up and wages would be affected. These overtures have already been made. There are very large stocks of dyes in Europe which could be dumped in this country."

Mr. Graham: Will he tell me where they are?

Sir Philip Cunliffe-Lister: I am told there are considerable stocks in Germany. Before this Act was passed, when for a time prohibition was lifted, enormous stocks were dumped in this country. (A Socialist member: £7,000,000.) There were at this moment products of American factories, already made, which were held in Europe, presumably to be dumped here. German manufacturing capacity was 50 per cent. more than that country required, and without any addition to that plant Germany could, in a month or two, dump the whole of the supplies this country could take.

Sir H. Samuel

Sir Herbert Samuel (L., Darwen) said that if the House of Lords insisted upon their amendment and the consequence was that the Expiring Laws Continuance Bill failed to pass a heavy responsibility would rest upon their shoulders. It would bring to an end prematurely, without consideration or discussion, a whole series of measures which Parliament had decided should continue. He hoped the House would agree with the motion before it.

Mr. T. Shaw

Mr. T. Shaw (Secretary for War) declared that it was a figment of imagination that the Lords' amendment meant that the Act could be dropped at the end of next year. The Lords would act in exactly the same way next year. The manufacture of dyestuffs was a minor part of the production of the largest makers of dyestuffs in this country, and they were not going to be crushed out of business by Germans underselling them. He did not believe that the dye industry was in the slightest danger. On the other hand, there was overwhelming evidence that, under the present system, there had been delays and difficulties in obtaining particular dyestuffs from abroad, with the result that orders had been lost. The price of the dyestuff was not the principal item to the manufacturer. It was a question of the novelty of the dyes and the quickness of getting them. Cotton employers whom he knew personally said quite definitely that so bad had things become that in one case certain goods had to be exported to Belgium to be dyed. "The officials of my Department," he continued, "are not expected to have a knowledge of trade and commerce. I must be responsible for policy, and I say that if you want chemical research, you must pay for it. Do not do it at the expense of the people of Lancashire."

Major Church

Major Church (Soc., Wandsworth C.) declared that there was no reasonable body of scientific opinion that had not condemned the Government for not renewing the Dyestuffs Act. At the British Association meeting a large number of the most eminent scientists in the country suggested that it would be an act of incredible folly on the part of the Government to withdraw the protection which was afforded to the chemical industry under the Act. What was said then had been substantiated since by the heads of organic chemical departments of practically every university in the country.

The result of the division was announced as follows:—

For motion to disagree with Lords' Amendment	244
Against	238
Government majority	6

The Lords' Amendment

Viscount Hailsham on the Case for the Act

When the House of Lords went into Committee on the Expiring Laws Continuance Bill on Monday, Viscount Hailsham moved an amendment that the Dyestuffs (Import Regulation) Act, 1920, should not, as proposed by the Government, come to an end on January 14 next but should be continued until December 31.

After referring to the history of dyestuffs production in this country and the position in 1914, he said that during the ten years since the passing of the Act the industry had made very remarkable strides indeed—so remarkable that, so far as one was able to judge, the main argument in the House of Commons against the continuance of the Act was not that the dyemaker had not done well, but that they had done so extraordinarily well that they were in no further need of protection. Both Germany and the United States had high tariffs which protected their home markets. If the British market was turned into an open market in January the first thing that might happen was that there might be a great deal of dumping of American and German products in this country. There was another more subtle and even more probable method of attack. Each year there was invented a number of dyes which by the excellence of their colour or quality had an advantage over dyes previously known. It was quite possible, and indeed probable, that the German makers, who were expert in producing these novelties, would sell their novelties on condition that the purchasers took bulk supplies from them of the more

ordinary dyes. The result would be that the British dye makers would lose their market and be largely put out of action.

There was no doubt that the textile trades were in a very serious state, but it was not due to any disparity with regard to dyes. The export of undyed textiles in 1929, as compared with 1913, was roughly one-half, while it was roughly one-third in the case of fully-dyed goods. That seemed to indicate that it was not a difficulty in connection with dyeing which had caused the disaster. On the other side, apart from the dyemakers, colour-makers were unanimous in pressing for the extension of the Act. So were the Federation of British Industries and the Institute of Chemistry. The War Office had a representative on the Licensing Committee. *Had he been consulted, and if so, what advice had he given ?*

Lord Parmoor

Lord Parmoor (Lord President of the Council) said that there had been ample inquiry and agreement that if this Act was prolonged it would be to the disadvantage of the great textile industries, particularly in Lancashire and Yorkshire. That was the vital and essential factor that had determined the Government on the present occasion. That was Socialism, and he gloried that it was Socialism ; that the decision of the Government was based on social service and social duty to the Lancashire and Yorkshire textile industries. It was an entire illusion to suppose that so far as the dyemakers were concerned they would be subject to the difficulties which had been pointed out. He did not believe there was the least risk of the subtle method being employed.

Earl of Crawford

The Earl of Crawford thought Lord Parmoor overlooked the importance of the dye industry to British industry as a whole. Ten years was the time originally proposed for the duration of the Act, and as the first two years were wasted, he thought the Government should give them back one of those two years. The dyeing industry was emphatically a key industry, and its ramifications were incalculable. People working in organic chemistry never knew what new discovery might not be made. And many had been made by men working on dyestuffs in industry. This country more than ever depended for its industrial and commercial future upon the successful prosecution of research, and particularly through the agency of organic chemistry. If in 1914 this country had had the well-developed dye works, laboratories, and workshops that we had to-day we should have brought the war to an end twelve months sooner than we did.

Marquis of Reading

The Marquis of Reading said the Secretary for War had told the House of Commons what were the views of his constituents. He might have taken the trouble to give the views of the Services. Was the Government so averse to inquiries ? Their almost inevitable answer in every difficulty was : "Let us refer it to a Committee." There was no doubt as to a number of abuses in unemployment insurance, yet the Government had had resort to a Royal Commission. In this case they were not asking for a Royal Commission but for an independent and impartial Committee.

Lord Cawley

Lord Cawley said he had been intimately connected with the Lancashire cotton industry for more than fifty years. What the dyemakers had done was not to encourage research and find billets for young chemists, but to manufacture in bulk, out of which they could make money. In 1920 there was a technical staff numbering 594 ; in 1928 it numbered only 378. Actually the company employed about twenty more chemists then than to-day. The whole thing was propaganda, and it was excellently well done. It was said there would be dumping, competition and ruin. That was all nonsense. If a company with a capital of £87,000,000, and with a chairman of the calibre of Lord Melchett, could not hold its own, no company could. His interests were in Lancashire, where there were 232,000 unemployed, and the overwhelming opinion in that county was that this prohibition did enter into the cost of the finished article they sent abroad.

The Committee divided, and there voted :—

For the amendment	87
Against	14
Government minority	73

Dyes and Textiles

Notes on Current Researches

Rayon staple fibre fabrics.—During the past three years woven fabrics made from viscose staple fibre such as Vistra and Fibro have been favoured by the public, probably because of their attractive subdued lustre and soft and warm handle. Recently this type of rayon has also been utilised in hosiery. It cannot be said that the manufacturing difficulties have been entirely overcome since garments and other materials made from such staple fibre have a tendency to become hairy in use. No doubt these difficulties will be surmounted. Meanwhile it is useful to note the publication of two articles* on the printing and utilisation of viscose staple fibre fabrics.

In one of these articles possibilities in the exploitation of staple fibre for artificial wool materials are discussed and cuttings of fabrics consisting of staple fibre and a small proportion of wool are given ; the other article gives practical details of the preparation of staple fibre fabrics for dyeing and printing, and their finishing after printing. It is important to note that the appearance of the fabric can be materially influenced by omitting the usual singeing process. For dark shades, bleaching with the aid of a hypochlorite may be avoided, it being sufficient to scour with a 0·2 per cent. solution of soap and Laventin KB at 50–60° C. for about one half-hour. In finishing, a wool-like handle is obtained by impregnating with a solution containing 0·1–0·3 per cent. of Monopole Brilliant Oil SO 100 per cent. and 0·1–0·2 per cent. of glycerine ; double these quantities can be employed when a very full handle is required. A silk-like handle is obtained by impregnating with a 0·3 per cent. solution of Marseilles soap and immediately passing through a 0·1–2 per cent. solution of lactic acid, and then drying.

Light activated action of acids on cellulose. Miss E. Hibbert† has observed that the tendering action of oxalic acid on cotton is much increased by exposure to sunlight. In contrast to acetic acid it has been found that when oxalic acid is dried into cotton appreciable tendering may occur (Knecht ; Proc. Manchester Lit. and Phil. Soc. 1908, April), but apparently the influence of light in this reaction has been quite overlooked.

If cotton be impregnated with oxalic acid and dried at ordinary temperature it shows, after washing out the acid, no increased affinity for Methylene Blue. But if the impregnated cotton be exposed to light from a Fadeometer a short time it acquires a definite increased affinity. This would indicate that light is necessary to activate the action of the oxalic acid.

Similar results were observed with other organic acids such as phthalic acid, and in this connection it must be remembered that other workers have shown that in the fading of certain vat dyes on cotton phthalic acid is formed. It may well be that the tendering of coloured cotton materials during fading may thus be accelerated by the acid formed as a decomposition product. The following results indicate the relative tendering action of various organic acids as induced by sunlight :—

Acid.	Tendering action as indicated by Methylene Blue absorption of the tendered cotton.
Oxalic acid	Great action.
Tartaric acid	Some action.
Malic acid	Slight action.
Phthalic acid	Slight action.
Citric acid	Very slight action.
Benzoic acid	None.
Salicyclic acid	None.

Crimp effects on cellulose acetate rayon.—When aqueous solutions of nitric acid of about 40 Tw. are allowed to react with cellulose acetate rayon a shrinkage occurs which is dependent on the conditions prevailing. This effect is utilised‡ for producing puckered or crimped rayon fabrics by printing the acid in the form of stripes or according to any desired pattern, when the non-printed portions become puckered. The acid can then be washed out with dilute alkali.

* *Textilberichte*, 1930, **11**, 619 and 620.

† *J. Soc. Dyers and Col.*, 1930, **46**, 294.

‡ E.P. 335,138.

Indian Chemical Notes

(From Our Indian Correspondent.)

The Report of the Salt Industry

The Indian Tariff Board, which has submitted its report on the salt industry of India, was directed to report whether it was desirable in the national interest that steps should be taken to encourage the production of salt in India suitable for consumption in those markets (Bengal and Burma) which were at present largely supplied from abroad. The present report is in regard to Bengal only, and in this province the annual demand of salt is approximately 500,000 tons. In this market the primary considerations by which the quality of any particular class of salt is judged are whiteness, evenness of grain, and absence of moisture. On the basis of these tests, imported salt falls into two broad classes: (1) brine salt, such as Liverpool and Hamburg salt; (2) solar salt, such as Port Said, Aden, and other Red Sea salts.

Price the Determining Factor

Apart from the qualities above mentioned, price is the determining factor in the demand for salt from any particular source of supply. The tendency for the last 40 years has been for the cheaper solar salts to replace brine salts. In this period the proportion of the market held by Liverpool salt has declined from 75 to 15 per cent. The price of salt in the Calcutta market has fluctuated violently. Freight constitutes almost half of the total cost of salt, and any considerable variation in freights must substantially affect salt prices, but the main cause of price fluctuation has been the operation of combines and dealers. On at least three occasions a combine has been formed with the ostensible object of stabilising prices, but in reality to retain the market against new importers. The latest of these combines was the Salt Importers' Association, Bengal, formed in 1927. This association artificially maintained salt prices at a high level during 1927 and 1928.

White Salt

About 14 lakhs of tons of salt are produced annually in India. Of this a very large proportion is dirty and unsuitable for crushing. In Madras and Bombay manufacture is largely in the hands of private individuals operating on a comparatively small scale. In Upper India the Rajputana sources of supply and the Punjab salt mines are worked by Government, which thus holds a monopoly of supply, and has the means of regulating wholesale prices. Except in the salt mines of the Punjab and North-West Frontier Province, where salt is mined or quarried, the methods of manufacture are in essence the same throughout India, namely, solar evaporation. Certain causes prevent the salt from attaining whiteness and the necessary amount of purity, but these causes are preventible, and the Tariff Board's conclusion is that salt of a quality suitable for consumption in the Bengal market can be manufactured by solar evaporation in any part of India where a brine supply is available, either from the sea or from subsoil sources.

Karachi, Okha, Aden

The present production of this quality, however, is small, amounting to about 15,000 tons. On a review of local conditions, the board is satisfied that the output of the existing works at Okha and Karachi could be increased to approximately 150,000 tons annually. Both these places enjoy certain natural advantages for the manufacture of fine white salt by solar evaporation. On a comparison of the results of the analysis and tests carried out at the Government Test House, Alipore, it is found that Karachi and Okha salt is not inferior in sodium chloride content or colour to Aden salt. Similarly the output of rail-borne salt (from Khewra, Sambhar) could be increased by 150,000 tons. This salt also compared favourably with Liverpool salt. Assuming, therefore, that Aden continues to import 180,000 tons of salt, practically the whole demand of the Bengal market could be supplied by India and Aden.

Sea-borne or Rail-borne

The board discusses the question of the possible supply of the whole market from sea-borne salt only—i.e., from Aden, Karachi, and Okha. The total labour force required for this purpose would not amount to more than 4,000. Similarly, taking profit at the rate of 10 per cent. per annum, the additional profit retained in the country would not exceed Rs. 12 lakhs. Lastly, the existence of adequate supplies at these sources would not necessarily guarantee Bengal against a shortage of white salt in wartime. So even from the point of view of national interest, the advantage of getting the supplies wholly from Aden, Karachi, and Okha is not so great as to justify any drastic action.

The development of the supply of rail-borne salt to the Bengal market offers the following advantages: (1) A guarantee against war time shortage; (2) additional traffic for railways; (3) a reduction in price of salt as the result of the increase in production, particularly at Khewra. The Tariff Board's conclusion is that in the national interest the Bengal market should be supplied by rail-borne salt, to be supplemented by sea-borne salt.

Stabilisation of Prices

The Tariff Board recommends that the question of railway rates should be fully investigated with a view to reducing the rates for salt to the lowest possible figure. But no development of Indian sources of supply is possible until prices in the Calcutta market are stabilised. And as long as the import of salt remains in private hands no stabilisation of prices is possible. The first step, therefore, is for the Government to introduce control. The effect of price fluctuations due to causes outside the control of the importer might be neutralised by the formation out of profits of a fund to be devoted to the maintenance of a standard price level. By price stabilisation the excessive profits of foreign manufacturers and middlemen would be eliminated. With additional sources of supply at its disposal, the Government may be in a position to make good to some extent local shortages. It will be possible to standardise quality, ensuring thereby better value to the consumer, and removing one cause of speculation.

A Marketing Board

The Tariff Board recommend that a marketing board should be eventually brought into existence, to whom the Government should sell its output at cost price. The board would be constituted as a public utility company, the rate of profit being limited, and would be free to adjust its prices so as to secure a more equitable distribution of price. It would be in charge of the import and sale of salt in the Calcutta market, and of the sale of salt in Northern India. The board would replace the present system of cost price ex works by a system of quotations for sale at destination. Foreign salt would be purchased only to the extent to which the demand cannot be supplied at the prices indicated from the Indian sources. In all cases salt would only be purchased if it conformed to the prescribed specification as regards sodium chloride content, colour, and grain. Surplus profits should be funded and utilised either for stabilising or reducing the price of salt.

An Interim Measure

As an interim measure it is proposed that the Government should assume control immediately of the import of salt in Bengal. Indian sea-borne salt should be purchased at a fair selling price, and efforts should be made to popularise the use of rail-borne salt (crushed) from Khewra and Sambhar by the reduction of railway freights, and, if possible, by the quotation of a lower rate for crushed than for uncrushed salt.

The balance of the requirements of the market should be purchased by Government from foreign manufacturers. Salt should be graded into two grades. A standard price for each of these two grades should be fixed, which in the first instance might be the average price of the last five years. After defraying the cost of administration, any surplus profits should be funded for the purpose of stabilising the price of salt. This price should not be changed save at lengthy intervals.

Government Action

A strongly-worded representation has been submitted to the Government by the Indian Merchants' Chamber, wherein it is urged that the Government should give prompt and immediate assistance to the Indian salt works, including that of Aden. The Chamber fears that unless this is done the Indian works at Karachi, Okha, and Aden will be crushed out of existence by the pressure of foreign competition. It is pointed out that the recommendations of the Tariff Board were made in March last, and that there has already been unpardonable delay. The letter further states that the position of the indigenous industry has been worsened by the intensive rate war and dumping carried on by the Port Said and Italian foreign syndicates.

British Chemical Overseas Trade in November

Poor Comparison with a Year Ago

BRITISH overseas trade in chemicals, as revealed by the Board of Trade returns, experienced a sharp setback during November, and exports at £1,569,001 were £991,494 lower than during November 1929. Imports at £858,442 were £510,384, down, and re-exports at £53,494 declined £24,557. Over the eleven months of the present year there are declines of £2,943,911 in imports, £3,600,839 in exports, and £7,211 in re-exports, compared with the corresponding period of 1929.

Imports

	Quantities Month ended November 30, 1929.	Quantities Month ended November 30, 1930.	Value Month ended November 30, 1929. £	Value Month ended November 30, 1930. £
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acetic Anhydride ..cwt.	Tons 168		102,817	515
Acid Acetic .....tons	2,785	490		16,064
Acid Tartaric .....cwt.	1,868	2,942	13,032	15,400
Bleaching Materials ,,	11,739	4,185	14,197	9,435
Borax ..... ,,	25,293	13,755	14,918	8,028
Calcium Carbide .. ,,	112,499	94,443	67,593	39,756
Coal Tar Products value	—	—	9,002	2,311
Glycerine, Crude...cwt.	20	1,223	52	1,893
Glycerine, Distilled ,,	1,275	1,515	3,034	3,295
Red Lead and Orange Lead .....cwt.	2,591	3,282	4,204	4,665
Nickel Oxide ..... ,,	98	—	322	—
Potassium Nitrate (Saltpetre) .....cwt.	8,994	13,914	9,012	11,894
Other Potassium Compounds .....cwt.	205,502	134,123	65,958	46,739
Sodium Nitrate ... ,,	133,149	59,234	61,287	26,637
Other Sodium Compounds .....cwt.	49,549	31,798	35,107	18,409
Tartar, Cream of .. ,,	2,754	2,401	12,669	10,000
Zinc Oxide .....tons	919	944	27,805	15,525
All Other Sorts ..value	—	—	349,884	182,113
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	167,656	114,127	11,912	8,254
Bark Cinchona (Bark Peruvian, etc.) ..cwt.	2,222	589	10,191	2,287
Other Sorts .....value	—	—	172,747	138,581
DYES AND DYESTUFFS—				
Intermediate Coal Tar Products.....cwt.	145	44	1,940	452
Alizarine ..... ,,	175	33	3,701	1,915
Indigo, Synthetic . ,,	—	—	—	—
Other Sorts ..... ,,	4,307	3,051	99,745	86,864
EXTRACTS FOR DYEING—				
Cutch .....cwt.	3,053	1,201	4,810	2,116
All Other Sorts ... ,,	2,584	1,060	11,024	4,880
Indigo, Natural.... ,,	—	37	—	760
Extracts for Tanning ..... ,,	61,549	64,723	60,713	62,637
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground ..cwt.	46,591	31,180	10,085	6,934
White Lead (dry) . ,,	18,427	15,179	31,971	22,612
All Other Sorts ... ,,	110,436	82,999	159,094	107,471
Total of Chemicals, Drugs, Dyes and Colours .....value	—	—	1,368,826	858,442

Exports

CHEMICAL MANUFACTURES AND PRODUCTS				
Acid Sulphuric ....cwt.	13,830	1,590	4,174	1,794
Acid Tartaric ..... ,,	1,639	1,154	11,481	6,405
Ammonium Chloride (Muriate) .....tons	409	405	6,855	7,524
Ammonium Sulphate—				
To Spain and Canaries tons	35,303	13,265	319,169	93,009
,, Italy ..... ,,	138	970	1,400	5,716
,, Dutch East Indies tons	393	3,123	3,732	23,369
,, China (including Hong Kong) tons	9,774	3,987	93,585	29,885
,, Japan ..... ,,	17,611	2,003	104,889	14,025
,, British West India Islands and British Guiana tons	601	489	5,482	3,540
,, Other Countries ,,	7,887	14,509	71,919	103,848
Total..... ,,	71,707	38,046	660,176	273,392

	Quantities Month ended November 30, 1929.	Quantities Month ended November 30, 1930.	Value Month ended November 30, 1929.	Value Month ended November 30, 1930.
Bleaching Powder ...cwt.	77,102	47,102	21,354	13,997
COAL TAR PRODUCTS—				
Anthracene .....cwt.	—	304	—	102
Benzol and Toluol galls.	28,339	5,499	2,588	478
Carbolic Acid.....cwt.	cwt. 2,339		29,873	4,899
Cresylic Acid ....galls.	21,906	89,532		9,483
Naphtha ..... ,,	5,678	1,685	696	220
Naphthalene (excluding Naphthalene Oil) cwt.	6,493	11,466	2,169	2,915
Tar Oil, Creosote Oil, etc. .....galls.	1,867,118	1,327,504	52,519	33,427
Other Sorts .....cwt.	27,047	8,704	22,693	7,151
Total.....value	—	—	110,538	58,975
Copper, Sulphate of .tons	1,844	2,344	44,422	42,499
Disinfectants, Insecticides, etc. .....cwt.	48,575	33,568	119,474	81,913
Glycerine, Crude ....cwt.	3,971	2,274	7,782	3,214
Glycerine, Distilled .. ,,	20,762	8,503	51,890	22,464
Total..... ,,	24,733	10,777	59,672	25,678
POTASSIUM COMPOUNDS—				
Chromate and Bichromate .....cwt.	1,247	1,118	2,434	2,308
Nitrate (Saltpetre) ,,	930	1,246	1,756	2,347
All Other Compounds ,,	3,008	1,080	11,670	7,391
Total..... ,,	5,185	3,444	15,860	12,046
SODIUM COMPOUNDS—				
Carbonate, including Soda Crystals, Soda Ash and Bicarbonate cwt.	538,368	258,093	142,327	72,258
Caustic ..... ,,	190,859	142,070	128,017	99,705
Chromate and Bichromate .....cwt.	2,468	3,276	5,920	4,888
Sulphate, including Salt Cake .....cwt.	224,292	169,871	23,470	23,193
All Other Compounds cwt.	79,888	38,857	93,054	41,510
Total..... ,,	1,035,875	612,167	392,788	241,554
Zinc Oxide .....tons	189	265	6,816	6,717
Chemical Manufactures, etc., all other sorts value	—	—	353,496	249,399
Total of Chemical Manufactures and Products (other than Drugs and Dyestuffs) ...value	—	—	1,807,106	1,021,590
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	189,672	88,658	20,080	9,487
All Other Sorts ...value	—	—	283,577	251,333
Total..... ,,	—	—	303,657	260,820
DYES AND DYESTUFFS—				
Products of Coal Tar cwt.	12,440	4,930	80,456	58,612
Other Sorts ..... ,,	10,161	8,503	12,043	7,747
Total..... ,,	22,601	13,433	92,499	66,359
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground ..cwt.	5,707	2,619	1,892	1,066
White Lead (dry) . ,,	3,215	1,765	6,831	3,184
Paints and Colours in Paste Form ....cwt.	40,886	27,229	82,823	50,285
Paints and Enamels Prepared (including Ready Mixed) ..cwt.	50,599	30,752	156,449	97,585
All Other Sorts ... ,,	59,780	40,837	109,238	68,112
Total..... ,,	160,187	103,202	357,233	220,232
Total of Chemicals, Drugs, Dyes and Colours .....value	—	—	2,560,495	1,569,001

Re-exports

	Quantities Month ended November 30, 1929.	Quantities Month ended November 30, 1930.	Value Month ended November 30, 1929. £	Value Month ended November 30, 1930. £
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Tartaric .....cwt.	77	152	674	910
Borax ..... ,,	12	524	9	400
Coal Tar Products value	—	—	9	1
Potassium Nitrate (Saltpetre) .....cwt.	69	36	89	50
Sodium Nitrate ... ,,	1,445	600	719	277
Tartar, Cream of .. ,,	280	288	1,533	1,510
All Other Sorts ..value	—	—	21,443	14,259
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	39,456	17,155	3,825	1,560
Bark Cinchona (Bark, Peruvian, etc.) ..cwt.	530	25	4,960	91
All Other Sorts ..value	—	—	33,236	28,043
DYES AND DYESTUFFS—				
Cutch .....cwt.	987	559	1,537	893
All Other Sorts ... ,,	249	79	2,550	1,043
Indigo, Natural.... ,,	5	2	103	54
Extracts for Tanning cwt.	890	2,462	1,425	2,713
PAINTERS' COLOURS AND MATERIALS.....cwt.	3,334	951	5,686	1,441
Total of Chemicals, Drugs, Dyes and Colours .... value	—	—	78,051	53,494

British Overseas China Clay Trade

The Returns for November

THIRTY-FIVE tons, valued at £143, from the United States were the only imports of china clay and china stone into Great Britain and Northern Ireland registered during the month of November.

The return of quantities and values of exports of china clay, including Cornish or china stone, the produce of Great Britain and Northern Ireland, registered in the month of November, is as follows :—

COUNTRY OF DESTINATION.	QUANTITY. Tons.	VALUE. £
Finland	359	450
Latvia	593	1,111
Sweden	2,120	4,312
Denmark (including Faröe Islands)	15	104
Germany	4,035	8,827
Netherlands	4,548	10,096
Dutch Possessions in the Indian Seas	51	90
Belgium	6,949	13,164
France	2,899	5,934
Switzerland	19	65
Portugal	10	38
Spain	2,038	4,928
Italy	186	351
Greece	7	31
Egypt	4	30
Siam	25	67
China	5	30
Japan	30	430
United States of America	17,027	36,888
Chile	2	11
Irish Free State	12	101
Union of South Africa	5	63
British India	83	385
Madras	—	4
Bengal, Assam, Bihar and Orissa	219	904
Malay States	—	11
Hong Kong	—	4
Australia	3	26
Canada	246	1,165
TOTAL	41,491	89,624

The Iodine Mercerisation Test

Society of Dyers and Colourists' Papers

A MEETING of the Manchester Section of the Society of Dyers and Colourists was held on Friday, December 12, in the Lecture Room of the Literary and Philosophical Society, Manchester. Mr. F. Scholefield, M.Sc., F.I.C., presided.

Mr. W. F. A. Ermen, M.A., gave an address under the title of "Notes on the Iodine Mercerisation Test," and said that the ordinary test for deciding as to whether a piece of cotton was mercerised or not appeared to be lacking in one respect, namely, that the results were not permanent. The test consisted in dissolving, in a saturated solution of potassium iodide, 40 grms. of iodine per 100 c.c. of liquor. The mercerised and unmercerised samples were immersed in the solution for a few moments and then washed. The brown coloration gave place to a blue colour, and, in a very few moments, the unmercerised sample lost all its iodine and became colourless, while the mercerised sample remained blue for some time. A strongly mercerised sample retained more blue, and did not wash out so quickly as a weakly mercerised sample, but nevertheless a permanent record could not be made except by photography. After studying the problem for some time he came to the conclusion that it might be possible to fix the iodine by treatment with silver nitrate which reacted with the iodine to give silver iodide, which was insoluble, and iodic acid, which, of course, washed out. By taking a mercerised sample and an unmercerised sample and washing them until the mercerised specimen had gone white, and treating them with a solution of silver nitrate, a sample was obtained which was blue coated with silver iodide and which was just noticeable by daylight as a pale cream colour. It was possible not only to obtain a great difference, but a permanent difference by treating the samples with sodium sulphide when black silver sulphide would be produced, but unfortunately the silver deposited was in such a form that it only appeared in a dirty brownish-yellow coloration. The test was unimpressive. It should be noted, however, that if the cloth was at all thick the blue colour of the iodine remained in the middle.

He then tried the effect of Indigosols, the result being extremely successful. A 5 per cent. boiling solution of Indigosol 04B. seemed to give as good a result as any. The reddish Indigosols either did not work at all or gave a very much weaker result than would be expected from the amount of iodine left on the cloth. By reducing the dissolved iodine in the liquor from 40 grms. to 6 grms. a further advantage was obtained that the washing was done in a minute or two, not very much water being used at first in order to remove the chemically precipitated iodine. The unmercerised sample would lose its colour rapidly, and in a moment or two would be ready for going into the Indigosol, the strength of which was not of any particular importance. It was an interesting point for consideration as to why iodine should be very much more strongly deposited upon mercerised than upon unmercerised fibres, and why, though it was able to keep its strength for a little while, it would not stay permanently under washing. By using the test it was possible to decide in a minute or two whether a sample was mercerised or unmercerised and to produce in permanent form a variation of coloration indicative of differences in degrees of mercerisation.

Theories of Lustre

A paper entitled "Theories of Lustre" was then read by Mr. J. M. Preston, B.Sc., A.I.C., who stated that lustre appeared to be partly a psychological and partly a physical phenomenon. Types of lustre were very difficult to express in physical terms and it was doubtful whether they could be completely expressed by methods adopted at present. The general conception of lustre appeared to be that the more regularly reflected light there was present in the light received by the eye from the yarn or fabric the greater the lustre. Therefore, it had been proposed to express that regular reflection as a ratio to the total light reflected, *i.e.*, the light reflected in all directions as contrasted with the amount of light regularly reflected in the direction in which a mirror would reflect light. It was necessary to differentiate between the lustre of fibres, yarns and fabrics, because a quite lustrous yarn could be woven into a fabric which would exhibit a relatively matt appearance with a certain type of weave. On the other hand, with a different type of weave again a fabric might be produced with a lustrous appearance.

The Colorimetry of Pigments

Important Method Described to Oil and Colour Chemists' Association

At a meeting of the Oil and Colour Chemists' Association on Thursday, December 11, a paper of considerable importance to the colour industry, entitled "The Colorimetry of Pigments," by Dr. G. F. New, Miss G. S. Disney and Miss D. L. Tilleard, was read by Dr. New.

THE basic fact upon which colour measurement and representation should rest, said Dr. New, was that any unknown colour could be specified and matched by a mixture of any three other coloured radiations. This, combined with the colour perceptive properties of the human eye, gave rise to a fundamentally correct method of representing the whole possible colour field by a solid of roughly pyramidal form. Basal sections of this pyramid produced the well-known colour triangle surrounded by a curved line representing the locus of the spectral colours in terms of the three primaries at the corners of the triangle. For practical convenience these primaries were chosen from the red, green and blue parts of the spectrum respectively, and Guild in his colorimeter,* has used as primaries spectral radiation 0·700 u (red), 0·546 u (green) and 0·436 u (blue) with white light equivalent to black body radiations at 5,000° A, obtained by running a gas filled lamp at a predetermined voltage and passing the light from it through two blue filters.

Measurements on Guild Colorimeter

Measurements made on the Guild colorimeter provided material for two graphs, the first of which showed the position of the colour on the trichromatic chart and the second showed the position of that chart in the colour solid. Thus a series of measurements made on a fading pigment mixture would be represented as a line on the trichromatic chart starting somewhere near the edge of the triangle and moving towards the central point which represented white. The second graph would take the form of a curve showing the increase in brightness of the specimen as fading progressed toward the 100 per cent. representing the brightness of a pure magnesium oxide screen used as a standard in the colorimeter.

Having demonstrated the methods of presenting graphically the colour changes corresponding with fading or progressive dilution with a solid white pigment, Dr. New proceeded to describe the method of preparation of samples of pigment for colorimetry which has been found most satisfactory. For most purposes the addition of a solid white diluent to the coloured pigment was an advantage, but precautions had to be taken in grinding the two together so that the colour did not deteriorate through excessive treatment. The best quality smooth surfaced drawing paper was found to be the most suitable support for the sample of pigment, both from the point of view of handling during the tests and also for convenience in measuring and storing for reference purposes.

Diluting Effects of White Pigments

Experiments on the diluting effect of white pigments such as zinc oxide or blanc fixe, showed that up to 40 per cent. on the average was required to be added to a pure dye pigment before any noticeable change in appearance supervened. This was due to the fact that most of the incident light on such a pigment mixture came into contact with at least one of the strongly optically absorbing coloured pigment particles before re-emission. It was only when greater dilutions than these were approached that an appreciable portion of the incident light was able to escape from the pigment layer without suffering colour change, and it was only when this stage was reached that the appearance, and therefore the colorimetric graphs, showed change.

From experiments with numerous different types of coloured pigments and white diluents, it had been found that the most useful ratio of coloured to white pigment for fading tests was approximately 1 of the former to 9 of the latter by weight. In this range of dilutions, fairly rapid initial fading was obtained and there was sufficient colour present to ensure that the fading could proceed long enough to enable accurate measurement to be made. With more concentrated mixtures than these the rate of fading was much less initially and with more diluted mixtures, although the rate of fading was greater, the extent of the fading was necessarily less because the starting point of the mixture was much nearer the final or white point. It was found that most of the pigments already examined faded in a simple manner, their trichromatic curves being almost straight lines towards the white point, indicating that little change in hue took place, the action being mainly a simple weakening of the tint.

Influence of Liquid Medium

The lecturer then described a series of experiments designed to show the influence of the liquid medium employed on both the final appearance of the pigment layer and the course of its fading. Several oil media were compared with an aqueous gelatin solution and a silicon ester medium as made by Albright and Wilson, Ltd. The oil media, owing to their smaller difference in refractive index from the indices of the pigment and to their more complete elimination of air from the pigment layer, gave deeper and more saturated tints than did the other two media in the presence of the same quantities of solid pigment and diluent. The course of the fading of pigment layers containing oil as media, however, was much less direct than with the other media and usually a prononuced change in hue occurred as well as weakening of the tint. With gelatin and silicon ester this was seldom found and for routine testing work one or the other of these media was recommended. They both interfered much less with the fading of a pigment than did the oils, since not only was their transparency to ultraviolet radiation greater than that of the oils but also they were much more inert chemically and chemical interaction between these two media and pigment in contact with them was much less likely than such interaction in the case of oil media.

Proceeding to the important subject of errors in reproducibility of results, Dr. New showed examples of repetitions in colorimetric observations by two observers on different samples of colour. The extent of the variations found with one observer was less than half a colour triangle unit on the trichromatic graph, and less than 2 per cent. on the brightness graph. When comparing two observers some larger differences than these were to be expected. It was therefore inadvisable to mix the readings from two observers on any one series of experiments, and it had been found that increased accuracy was obtained if sets of measurements of a series of pigment samples were all made on one day by the one observer, rather than to carry out each separate measurement as the sample became available.

Scale of Fastness for Dyes

After briefly reviewing the many attempts that have been made in various parts of the world during the last few decades to bring into being a satisfactory scheme for measurement and classification of fastness, Dr. New described the application of standard methods based on the above experiments to the formulation of a scale of fastness for dyes which it was anticipated would prove more satisfactory than those which had previously been suggested.

Results were given showing that the ratio of the rate of fading under the carbon arc, which had been employed for most of these researches, and that in sunlight at Teddington, varied from pigment to pigment in a striking manner. For instance, while one pigment faded 2·08 times as fast in the arc as in the sun, another faded only 1·18 times, and a third 0·68 times as fast. The sunlight exposures were carried out according to the method recommended by the Research Committee of the American Association of Textile Chemists and Colorists.* It was well known that sunlight varied from hour to hour in the intensity of the actinic effect and also from mile to mile over the earth's surface, whereas the enclosed plain carbon arc which he had employed was constant in time and place. Mercury vapour lamps had not been used, owing to

* "A Trichromatic Colorimeter suitable for Standardisation Work." J. Guild, *Trans. Opt. Soc.* 27 (1925-6), p. 106.

* *American Dyestuff Reporter*, November 14, 1927.

the greater difference between their spectral characteristics and those of sunlight.

A series of red dye pigments representative of the whole range of fastness commercially employed at the present time had given trichromatic fading curves when exposed to a plain carbon arc carrying 12·5 amperes D.C., such that on the graph they were placed almost exactly in the order of fastness which a representative group of British colour makers had expected from their practical experience. Only one pigment out of twelve examined in this way was thought by two out of seven of these critics to be slightly out of its correct position. With remarkable practical confirmation of the utility of this method of testing in mind, a preliminary standard method for the testing of fastness of pigments based on these researches could be put forward.

The Scale of Fastness

British colour makers had expressed a preference for the use of ten groups to represent the scale of fastness, No. 1 containing the most fugitive pigments. In this way unlimited further groups were available for organic pigments of increased fastness which might be discovered in the future, and for inorganic pigments if it were desired to link them up with this classification. The groups were based on the number of colour triangle units through which a sample of the pigment, prepared in the specified manner and exposed to the carbon arc as above described, faded in the course of 100 hours—shorter or longer test periods being given according as pigments were more or less fugitive. The great advantage of this method of classification of fastness was that it depended not on a series of named pigments which might vary considerably from maker to maker and from time to time in their durability, but on direct determination of durability in numerical form, and it was to be expected that many of the defects of previous fastness classifications would be absent from this one.

The Chairman (Mr. S. G. Clifford) said the paper was one of those which indicated where research leads to, matters of practical importance. Very soon, apparently, we should be able to get from the printing ink makers a definite guarantee that their colours would not fade.

Dr. T. M. Lowry, F.R.S., said he had never heard a paper on colour work of such a high order of merit as this one. With regard to standardisation, it was curious the author should suggest eliminating the first 50 hours because some of the pigments exhibited faded in 45 hours.

Dyestuffs Act and Lake Making Industry

Dr. L. A. Jordan said this research work had been going on for a long time at the Research Association. One of the first things the original committee which looked into the programme of research did was to give instructions for matters relating to colour to be reviewed and, if possible, urged that some work should be started with a view to placing the problem of the fading resistance of pigments on a better basis. The outcome of those instructions was the paper by Dr. New. This work had been carried through entirely with the concurrence and co-operation of the colour makers in this country. That was a very important step and one which augured well for the proper utilisation of these results. In addition, the Council of the Research Association was satisfied that this work that had been done was of almost international importance. It was not, perhaps, original in the ordinary sense of the word. The use of the colour triangle was not original nor was the use of the colorimeter, but what was new was the juxtaposition of these things, as was the fact that the aim all through has been the industrial requirements of the industry. That being so, this work should go a long way, properly used, to lift the industry of colour making in this country on to a higher plane than before. It would have been almost certain to have done that but for the fact that whilst one prop was being placed under the industry in this way another prop was being knocked away. Although the professors had said their word in the Press about the importance of research to industry nobody had brought forward any vestige of excuse why the Dyestuffs Act should be removed, and one could only come to the conclusion that it was the sport of political opinion. It was a wicked shame that the business of colour making and dyestuffs making should be the sport of politics, because the results were going to be serious. A great deal was said about the dyestuffs industry, but the lake making industry in this country would stand or fall with the dyestuffs industry and, being smaller and more delicate, it stood a chance of falling a good deal farther than dyestuffs. There were both large and small firms making dyestuffs in this country, but he did not worry very much about what was going to happen to the large firms. He could quite well understand that I.C.I. would easily make arrangements with the I.G., but what was going to happen to the small firms who made lakes? They would not be in a position to make agreements with the I.G., and he was very much afraid that the lake making industry in this country would, unless we were very careful, be in the same deplorable condition that the industry of lake chrome and prussian blue had been for the past two or three years.

The Buenos Aires Exhibition

Mr. John Benn's Preliminary Tour

AT the invitation of Don Agustin Edwards, the well-known banker and newspaper proprietor, Mr. John Benn will first visit Chile during his tour in South America, before attending the Buenos Aires Exhibition on behalf of THE CHEMICAL AGE. Instead of going direct to the Argentine, our representative will obtain a first-hand acquaintance with other parts of South America, which should prove of much value in reporting the Exhibition. It will be possible, for instance, to see something of agricultural conditions on this vast continent, where there are big openings for every kind of agricultural machinery and farming requirements. Mr. Benn will travel by way of the Panama Canal to Valparaiso, calling *en route* at Lima, the capital of Peru. After a short stay in Chile, he will cross the Andes into Argentina, going by train through the extensive agricultural areas for which this country is world-famous.

Visits to Local Agents

During the period of the Exhibition, which opens on March 14, our representative will call on many local agents, to whom introductions have been given by British manufacturers. Inquiries will be made as to the best possibilities for developing trade in this important market. In spite of the many years in which British enterprise has been engaged in the Argentine, there are still tremendous openings for the establishment of local agencies, and many big firms have still to undertake this necessary step in order to ensure adequate returns in the future. It is becoming more essential than ever to approach Spanish buyers in their own language, and considerable strides have been made by our American and German competitors in this vital matter. The fact that the Exhibition will be an " all-British " enterprise makes it the most important opportunity ever afforded to capture the South American markets. The Prince of Wales will perform the opening ceremony, and no better proof of the possibilities of the Exhibition could be afforded to British manufacturers or to their South American customers.

The Dominions are taking their share, and the Canadian Government is erecting a pavilion, covering 40,000 square feet, which will house the exhibits of more than 100 firms. A party of 200 Canadians will sail from Halifax at the beginning of March to pay a commercial visit to Latin-American countries, and in the course of their tour they will spend a week in Buenos Aires.

At the present time the Exhibition grounds provide a scene of great activity. The total area of the stands will cover about 25 acres, and many buildings are still being completed. Work is not made easier by the intense heat, as the seasons are, of course, reversed in this southern latitude. The summer heat is greatest about Christmas time, but the temperature will be most suitable for the Exhibition in March and April, which are the autumn months.

Coal Tar Derivatives for Steel " Pickling "

IN the German steel industry, reports the U.S. Trade Commissioner at Berlin, it has been found that certain coal-tar distillation products are well adapted for use as " inhibitors " by reducing the attack on the steel itself of acids used to remove scale and rust. Of particular efficacy in this respect, it is claimed, are pyridine, quinoline, naphtho-quinoline acridine, and also a special preparation containing rosin-like condensation products.

From Week to Week

ONE OF THE LAST ACTS of the late Sir Otto Beit, it was revealed last week, was to give a further £8,000 to provide radium for London hospitals.

DR. D. F. TWISS (chief chemist of the Dunlop Rubber Co., Ltd., and a former chairman of the Birmingham and Midland Section of the Society of Chemical Industry) was last week elected chairman of the Midland Section of the Institution of the Rubber Industry.

THE IMPENDING LAPSE of the British import duty on incandescent mantles on December 21 is reported to be viewed with much satisfaction by German manufacturers, who formerly exported nearly twenty million mantles a year to England. In 1929 this figure had declined to seven million.

NO STEPS, stated Mr. Arthur Henderson in the House of Commons on December 10, were being taken to secure the general prohibition of the use of smoke screens. In so far as they did not contain poisonous elements, they were not within the scope of the Gas Protocol, and in so far as they did, they were already prohibited.

MR. DOUGLAS CROCKATT, a director of John Crockatt, Ltd., Leeds, has been selected as President of the National Federation of Dyers and Cleaners for 1931, in succession to Mr. F. C. Carter, of Southampton. The Federation is composed of three Associations representative of London and the Southern Counties, Northern and Midland Counties, and Scotland, and includes most of the firms in the industry in Great Britain.

THE FINNISH FIRM of Hackman and Co., of Viborg, is reported to have secured patent rights for a recently invented process for the exploitation of raw sulphate liquor by treating it with sulphite-waste-lye, making a soap with great cleansing properties. The question of large-scale production is being studied. Another soap development is planned by the American Klenzit laboratory, who are preparing to manufacture "rice soap" on a large scale from rice hulls, hitherto regarded as waste.

CHRISTMAS HOLIDAYS.—Lever Brothers, Port Sunlight, and Price's Patent Candle Co., Bromborough Pool, will close for the Christmas holidays, from December 24 to 29. Brotherton's (the Mersey Chemical Co.), Bromborough Port, will close the greater portion of their works from December 24 for ten days. The works, warehouses and offices of Howards and Sons, Ltd., Ilford, will be closed on December 25, 26, and 27 and the warehouses will also be closed on December 31 for stocktaking.

THE ROYAL INSTITUTION has received an intimation from the Pilgrim Trust that the Trustees have allocated the sum of £16,000 to meet the deficiency on the fund for reconstruction of the Institution. The Trustees state that, in making this grant, they had regard to the distinguished scientific services rendered to the whole community by the Royal Institution for over a century, and to the approaching Faraday Celebrations. They were also not unmindful that the founder of the Royal Institution, Count Rumford, was of American origin.

RECENT WILLS INCLUDE Professor Harold Dixon, formerly of Manchester University, President of the Chemical Society from 1900–11, and during the War Deputy-Inspector of High Explosives for the Manchester area, and late Supervisor of Research on ignition of gases under the Safety in Mines Research Board (net personalty £10,052), £11,188. Mr. Ernest Edmund Barnes, of Chesterfield, Derbyshire, a director of the National Benzole Co., Ltd. (net personalty £78,942), £89,082. Mr. Arthur Ernest Malpas, of Liverpool, chemical engineer, for many years chief engineer with the United Alkali Co. (net personalty £976), £2,407.

A SERIES OF FOUR BOOKLETS of considerable interest to firms who are contemplating sending representatives to Mediterranean countries has just been issued by the Department of Overseas Trade. They consist of hints to commercial visitors, describing transport conditions and facilities, customs of the countries, hotel accommodation, and other matters with which strangers should be acquainted. The countries dealt with in the four booklets and the reference numbers of each are: Egypt (C3390); Algeria, Tunisia, Tripolitania and Cyrenaica (C3392); the Tangier, Spanish and French zones of Morocco (C3395); Syria and Lebanon (C3399).

A SETTLEMENT was reached last week in the dyeing trade dispute at Macclesfield, Cheshire, and the 600 workers involved resumed work on Monday last.

THE WILLIAM MENELAUS Memorial Lecture of the South Wales Institute of Engineers was delivered last week by Dr. Henry George A. Kickling, professor of geology at Armstrong College, Newcastle, who dealt with the microscopic and chemical analysis of coal.

THE MELCHETT MEDAL of Institute of Fuel for the year 1930, the first to be awarded, will be presented to Dr. Kurt Rümmel, of the Warmestelle, Dusseldorf, by Sir David Milne-Watson (president) on Friday, January 23, at the Institution of Civil Engineers, London. After the presentation Dr. Rümmel will give the Melchett Lecture and has chosen for his subject "The Calculation of the Thermal Characteristics of Regenerators."

THE TOTAL COST of the Forest Products Research Laboratory, it is announced by Mr. N. R. Smith, in the House of Commons on Tuesday, had been £175,876 up to March 31 last. This sum includes £1,653 for the ground and £69,371 for the building and initial equipment. The provision for running expenses taken in the current year's Estimates of the Department of Scientific and Industrial Research, which is responsible for the laboratory, was £34,092, to which should be added, say, £6,000 for allied services borne on Votes of other Government Departments.

A JOINT CONFERENCE was held at Manchester on Friday, December 12, between representatives of the Allied Association of Bleachers, Dyers, Printers, and Finishers, and the executive committee of trade unions in the industry. The purpose of the meeting, over which Sir Thomas Robinson presided, was to discuss the exceptional depression in the dyeing trade. The general situation was reviewed in all its aspects, and it is understood that certain proposals were put forward for combating the depression. The meeting was adjourned to a date not fixed.

"THE REAL CRITERION of research ability is intelligence and not numbers," writes Major F. A. Freeth, Research Director of Imperial Chemical Industries, in reference to arguments in the recent Dyestuffs Act debates in Parliament, where it has been urged that research staffs have decreased in numbers and therefore in efficiency. "There is no doubt but that if it were possible to collect ten of the greatest men who have appeared in organic chemistry during the last 100 years they would easily outdistance a team of 200 of the men who are likely to appear during the next five years."

A THIRD INTERNATIONAL CONFERENCE on bituminous coal is to be held at the Carnegie Institute of Technology, U.S., in November, 1931, and an invitation is being extended to scientists of all countries to take part. As in the conferences of 1926 and 1928, the purpose will be to present for discussion the result of recent studies of coal. The programme will include papers on carbonisation, liquefaction and gasification of coal; by-products of coal; the mechanism of combustions; cleaning of coal and its preparation for the market; pulverised fuels; power plants, and domestic heating—in fact every aspect of coal above ground will be treated by outstanding authorities.

THE IRISH FREE STATE Government are advertising for offers for the purchase during 1931 of tobacco stalks which have been abandoned by manufacturers to the Revenue Commissioners. It is estimated that about 212 tons will be available, 185 tons at the Dublin warehouse and 27 tons at Cork. There is usually a good demand for the stalks by manufacturers of insecticides and sheep dip, large quantities of both being used in the Free State. In the Dail recently, during a debate on tobacco growing, a deputy suggested that a coarse type of tobacco should be specially cultivated in Ireland in order to supply the nicotine necessary for sheep dip. The motion failed to meet with approval.

Obituary

PROFESSOR FRIEDRICH PREGL, the Austrian biochemist and a Nobel prizewinner, on December 13, aged 61.

MR. JOHN WALKER, of the firm of W. G. Walker and Sons, Ltd., tar distillers and lamp black manufacturers, of Glasgow and Ayr, aged 81. He was one of the first to introduce tar macadam as a paving for roadways in Scotland.

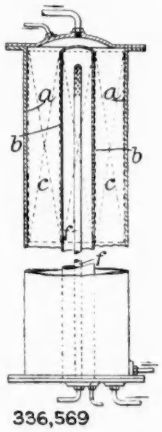
Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

336,569. Catalytic Hydrogenation. Technical Research Works, Ltd., and E. J. Lush, 4, Milner Street, Chelsea, London. Application date, July 11, 1929.

In apparatus for catalytic hydrogenation, the nickel catalyst *c* is packed between two gauze cylinders *a*, *b* having



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diameters of 18 inches and 6 inches. The central space may contain a further gauze cylinder with catalyst. An internal and an external cathode are employed during anodic oxidation. The gauze cylinder is of copper or copper-nickel, which is more resistant to anodic oxidation than nickel.

336,580. Dyes. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 14, 1929.

These dyes are obtained by coupling a component containing at least one sulphonic group with a diazotised aniline derivative containing a hydrogenated benzene nucleus in *p*-position to the NH_2 group, and which may contain a halogen atom or an alkyl or alkoxy group in *o*-position to the NH_2 group. The products dye wool from an acid bath bright yellow—red—violet—brown, fast to washing and milling. Examples describe the preparation of 4-amino-$2^1:3^1:4^1:5^1$-tetrahydro-diphenyl→2 : 7-naphthol-sulphonic acid (clear red), 4-amino-3-methoxy-hexahydro-diphenyl→1 : 4-naphthol-sulphonic acid (bright red), 4-amino-hexahydro-diphenyl → 1-(4^1-sulpho)phenyl-3-methyl-5-pyrazolone (clear yellow), and 4-amino-3-methyl-hexahydro-diphenyl→(alkaline) 1-benzoylamino-8-naphthol-4 : 6-disulphonic acid (bright red). A number of other diazo components and coupling components are referred to.

336,583. Hydrogenating Aromatic Compounds. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 10, 1929.

Aromatic hydrocarbons and their hydroxy-amino compounds are hydrogenated below 350° C. in the presence of mixed catalysts consisting of oxides, hydroxides, or sulphides of metals of group 6 mixed with metals of group 8 or heavy metals of group 1 or their compounds deposited on carriers of large surface. Activators such as oxides, hydroxides or sulphides of elements of groups 2—7 may also be present. Examples describe the hydrogenation of benzol with a catalyst of platinum sulphide and tungsten sulphide on active silica, or alternatively, tungstic sulphide and nickel sulphide on bleaching earth; naphthalene with a catalyst of oxides of nickel and molybdenum and calcium carbonate on active charcoal; anthracene with a catalyst of cobalt sulphide and molybdenum sulphide on Florida earth.

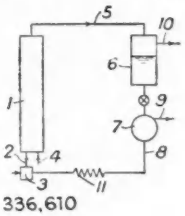
336,603–4. Absorbing Olefines in Acids. H. D. Elkington, London. From Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, June 4, 1929.

336,603. Ethylene is absorbed in sulphuric acid in the presence of soluble compounds of osmium, iridium, platinum, ruthenium, rhodium, palladium, copper, iron, cobalt or nickel. The compounds, after addition to the acid, may be converted into more complex compounds by passing carbon monoxide or nitric oxide through the solution. Insoluble compounds or the metals themselves may be added to the acid and converted into soluble complex compounds in this manner. Solvents such as ethyl alcohol may be added, as well as absorption accelerators such as froth-forming substances or emulsifying agents. The method may be applied to ethylene-containing gases, and the product may be converted into esters, alcohols or ethers.

336,604. The above catalysts are employed in the absorption of olefines, having more than two carbon atoms and one or more double bonds in the molecule, in sulphuric acid, phosphoric acid, or strong sulphonic acids. The method may be applied to crude gases containing olefines with more than three carbon atoms to the molecule, *e.g.*, natural gas or cracking gas, and the product is hydrolysed and distilled or otherwise treated to obtain alcohols, esters, or ethers. Several examples are given of the absorption of propylene in sulphuric acid containing platinum on carbon black, cuprous cyanide, cuprous oxide treated with carbon monoxide. Cuprous cyanide may also be employed in the absorption of propylene in ortho-phosphoric acid, and benzene-sulphonic acid.

336,610. Destructive Hydrogenation. C. F. R. Harrison and E. D. Kamm, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, July 16, 1929.

Coal paste is preheated in a mixer 3 and passed into the reaction vessel 1, into which preheated hydrogen is admitted at 4. All the products pass through pipe 5 to a catch-pot 6



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heated to 350° C., in which heavy oils are condensed, while vapours of middle and light oils are drawn off at 10. The heavy oils and solids are filtered at 7, and the heavy oil passes through a heater 11 to the mixer 3. An example is given of the treatment of a paste of coal and oil, yielding petrol 25 per cent., middle oil 35 per cent., and gas 18 per cent.

336,616. Hydrocarbons. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 17, 1929.

Phenols are treated with hydrogen at 250°–400° C. and a pressure above 50 atmospheres in the presence of oxides or sulphides of metals of groups 2—7, mixed with copper, silver, gold, or metals of group 8 or their oxides or sulphides. The products are hydroaromatic hydrocarbons. Catalysts are described containing oxides or sulphides of cobalt and tungsten, iron and molybdenum, nickel and chromium, nickel and arsenic, cadmium, iron and antimony, platinum and tungsten, silver and molybdenum, and many others. The catalyst may be deposited on a carrier. Examples are given of the production of cyclohexane from phenol, hexahydro-toluene from cresol, hydrogenated naphthalene from the distillation residu

of α-naphthol, and a mixture containing tetra- and deca-hydronaphthalenes from crude β-naphthol.

336,623. HALOGENATED FATTY ACIDS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 15, 1929.

Saturated or unsaturated fatty acids containing more than eight carbon atoms, and which may contain hydroxy groups, are halogenated so that at least three halogens enter the molecule, one at least replacing the hydrogen atom. Examples describe the preparation of tri-chlorinated, hexa-chlorinated and tetra-brominated ricinoleic acid, tri-chlorinated oleic acid, and penta-chlor-di-hydroxy-stearic acid. A chlorinated ricinoleic acid containing 16 atoms of chlorine may also be obtained. The products are oils or plastic or resinous substances.

336,633. ABSORBING ETHYLENE IN ACIDS. H. D. Elkington, London. From Naamlooze Vennootschap de Baataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, June 4, 1929.

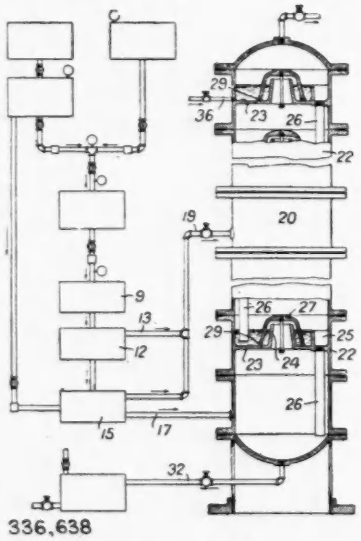
Ethylene is absorbed in sulphuric acid in the presence of finely divided platinum, vanadium, osmium, iridium, ruthenium, or rhodium, or their compounds, deposited on carbon black, silica gel or decolorising clay. Solvents such as ethyl alcohol, acetic acid, nitro-benzene, or ether may be added, as well as absorption accelerators such as froth-forming agents or emulsifying agents. Examples are given of the absorption of ethylene in 96 per cent. sulphuric acid in the presence of platinum precipitated on carbon black by the action of formaldehyde and alkali on platinic chloride; also an example employing rhodium black as catalyst.

336,635. HYDROGEN AND CARBON MONOXIDE. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 8, 1929.

Methane or gas mixtures containing it are passed with water vapour through a gas producer containing coke at 800°–1000° C. Thus, waste gas from ammonia synthesis containing methane, hydrogen and nitrogen, is passed with steam during the cold blowing stage through a water gas producer, yielding a gas containing hydrogen, carbon monoxide, nitrogen, and some carbon dioxide. Reference is directed by the Comptroller to Specification No. 102,152.

336,638. NITRIC ACID. W. W. Triggs, London. From E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. Application date, April 17, 1929.

Nitrogen oxides are produced by the arc process or from catalytic oxidation of ammonia, and are absorbed in water



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or nitric acid at a pressure of 50–100 lbs. per square inch. The absorption tower 20 contains 10–20 sections 22, each consisting of an annular cup 23 with a dome 27. Liquid passes downwards through pipes 26 and overflows into cups 25 to the next section, while gas bubbles under the rims of the domes 27. A mixture of air and ammonia is oxidised in the chamber 9, and the products are condensed in the condenser 12, from which liquid passes from pipes 13, 19 to the middle of the tower. The nitrous gases are oxidised in a chamber 15 and pass by pipe 17 to the base of the tower. Water is supplied to the uppermost section through pipe 36, and concentrated nitric acid is withdrawn through pipe 32.

336,646. DYES. W. W. Triggs, London. From E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. Application date, July 12, 1929.

Diazo compounds free from sulpho and carboxy groups are coupled with an N-aminobenzoyl-aminobenzoyl-J-acid, the resulting monoazo compound is diazotised and coupled with a sulpho- or carboxy-aryl-pyrazolone or a sulpho- or carboxy-indole. These disazo dyes may be reduced with stannous chloride to obtain amino derivatives corresponding to the first components used, 2-(aminobenzoyl-aminobenzoylamino)-5-hydroxy-6-naphthylamine-7 sulphonic acid and either amino-pyrazolone or aminoindole sulpho- or carboxy-acids. Examples describe the dyestuffs aniline → N-*p*-aminobenzoyl-*p*-aminobenzoyl-J-acid → 1-(*p*-sulphophenyl)-3-methyl-5-pyrazolone with several other first components, middle components and end components.

336,668. ALIPHATIC ANHYDRIDES. H. Dreyfus, 22, Hanover Square, London. Application date, July 19, 1929.

The acid vapour is heated in contact with a known catalyst supported on asbestos, *e.g.*, acetic acid vapour is passed through a copper tube at 400°–500° C. containing calcium tungstate on asbestos.

336,671. CHROMIUM OXIDE. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 19, 1929.

An alkali chromate or bichromate, free from impurities such as iron, is reduced with sulphur in solution or suspension in conjunction with sodium hydroxide, carbonate, sulphide, or polysulphide, and the resulting chromium hydroxide is ignited at 900° C. to obtain chromium oxide for use as a pigment, etc. The temperature of the reduction varies from 105°C. to 120°C., and the colour of the ignited product varies correspondingly from yellow to blue.

336,677. LIME-NITROGEN. Elektrochemische Ges., and H. Grohmann, Hirschefelde, Saxony, Germany. Application date, July 20, 1929.

Calcium carbide is heated to 800° C. in nitrogen which is supplied through cardboard tubes inserted in the powder. The heat of the reaction fuses the mass which remains sufficiently viscous to retain the channels.

336,681. DIALKYL SULPHATES. Etablissements Lambiotte Frères, 3, Rue d'Edimbourg, Paris. International Convention date, June 25, 1929.

Dialkyl sulphates are obtained by treating the corresponding ether with concentrated oleum in theoretical proportions below 50° C. and distilling the product. The residue of sulphuric acid may be used to obtain further quantities of the ether. Examples are given of the preparation of dimethyl sulphate starting with methanol, and dipropyl sulphate.

336,692. TREATING PHOSPHATES. A. Holz, 18, Sherman Place, Irvington, New Jersey, and T. van D. Berdell, 39, Broadway, New York. Application date, July 30, 1929.

Tricalcium phosphate materials are treated with a mixture of sulphuric and nitric acids in the proportion of 1 : 4. The solution of phosphoric acid and calcium nitrate is treated with potassium hydroxide or carbonate. Dicalcium phosphate is formed, and is removed and dried. The solution of potassium nitrate is evaporated to dryness and mixed with the dicalcium phosphate.

336,749. METAL CARBAMATES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 19, 1929.

Ammonium carbamate is treated with dry finely divided metal oxides in the absence of solvents at temperatures below 100° C. Alkaline earth carbamates may thus be obtained and may be heated to 700° C. in the presence of ammonia to obtain cyanamides. The preparation of the carbamates of calcium, zinc, and magnesium are described.

336,775. DYES. A. G. Bloxam, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, October 3, 1929.

Isodibenzanthrone is chlorinated in presence of a halogen carrier to obtain products having more than two chlorine atoms in the molecule, *e.g.*, with antimony pentachloride, with sulphonyl chloride, with anhydrous ferric chloride and with chlorine, to obtain blue-violet dyes.

336,800. DYE INTERMEDIATES. W. W. Groves, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 18, 1929.

A naphthalene dicarboxylic acid other than a *peri* or an *ortho* acid is condensed in the presence of phosphorus trichloride with a hydroxyarylamine which has a free *o*- or *p*- position relative to the hydroxy group, *e.g.*, naphthalene-1 : 5-dicarboxylic acid and 3-aminophenol. The products are dihydroxyanilides of naphthalene dicarboxylic acids capable of being coupled with a diazo compound. Several other condensations are described.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—317,373 (F. Krupp Akt.-Ges. Friedrich Alfred Hütte), relating to refining of iron or steel, see Vol. XXI, p. 37. (Metallurgical Section).

Specifications Accepted with Date of Application

316,144. Condensation products of urea and formaldehyde, Production of. S. Goldschmidt and R. Mayrhofer. July 23, 1928.

317,780. Purifying from naphthalene the distillation gases from coal, Processes for. Gewerkschaft M. Stinnes. August 22, 1928.

318,177. Steel having good machining properties, Manufacture of. F. Borggräfe. August 29, 1928.

318,839. Dyestuffs and intermediate products, Manufacture of. Soc. of Chemical Industry in Basle. September 8, 1928.

338,668. Aluminium, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 4, 1929.

338,854. Oxygenated organic compounds, Manufacture of. H. Dreyfus. July 24, 1929.

338,886. Blast roasting or sintering of ores and metallurgical materials. National Processes, Ltd., and T. B. Gyles. August 27, 1929.

338,912. Heat treatment of alloy irons and steels. P. R. Kuehnrich and Darwins, Ltd. August 28, 1929.

338,924–5. Ferrous alloy or cast iron, Treatment of. A. F. Burgess. (*Link-Belt Co.*). May 31, 1929.

338,930. Dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). July 22, 1929.

338,938. Chromium trioxide, Manufacture of. C. Arnold. (*Harshaw Chemical Co.*). July 30, 1929.

338,940. Bleaching powder, Manufacture of. E. Krebs. July 30, 1929.

338,981. Esters of phosphorous and phosphoric acid containing halogen, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 31, 1929.

339,024. Organic compound, Production of. J. Pease and F. Newell. (*E. L. d'Asteck.*) September 20, 1929.

339,028. Eliminating the silica in the treatment of natural silicates with acids for the purpose of rendering soluble some of their constituents. F. Jourdan. October 22, 1928.

339,029. Mono-azo dyestuffs, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) September 24, 1929.

339,040. Destructive hydrogenation. H. P. Dean and Imperial Chemical Industries, Ltd. October 4, 1929.

339,045. Concentrated formic acid solutions, Preparations of. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. October 31, 1928.

339,093. Acetylene and hydrogen halide, Manufacture of addition products from. Consortium für Elektro-Chemische Industrie Ges. November 19, 1928.

339,135. Polymerisation products of diolefines, Production of. J. Y. Johnson and A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 20, 1929.

339,144–8. Regulating the temperature of flowing reaction mixtures, Methods of, and means for. Holzverkohlungs-Industrie Akt.-Ges. January 18, 1929, and November 2, 1929. 339,148 addition to 339,144.

339,220. Cyanates, Preparation of. Deutsche Gold-und Silber-Scheideanstalt vorm. Roessler. April 10, 1929.

339,235. Carboxylic acids from nitriles, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 18, 1929.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Asahi Kenshoku Kabushiki Kaisha. Regeneration of caustic alkali waste liquors. 37,149. December 9. (Japan, December 17, 1929.)

Associated Lead Manufacturers, Ltd. Drying, etc. of mixtures of liquids and solids. 37,443. December 11.

Bunbury, H. M. Sulphonated linseed oil. 37,398. December 11. 37,398.

Canadian Electro Products Co., Ltd. Process of producing acetic anhydride from ethylidene diacetate. 37,474. December 12. (United States, December 12, 1929.)

Carpmael, A. and I.G. Farbenindustrie Akt.-Ges. Manufacture of pure rubber hydrocarbons. 36,996. December 8.

—— Manufacture of anthraquinone compounds. 37,261. December 10.

—— Manufacture of 1 : 4-diaminoanthraquinone. 37,303. December 10.

—— Manufacture of 1 : 4-aminohydroxyanthraquinones. 37,304, 37,305. December 10.

—— Manufacture of condensation products of the anthraquinone series. 37,407. December 11.

Du Pont de Nemours and Co., E. I., and Imperial Chemical Industries, Ltd. Coating-compositions. 36,942. December 8.

Forwood, G. F., and United Kingdom Oil Co., Ltd. Catalysts for conversion of hydrocarbons. 37,550. December 12.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Production of mottling, etc. in paper, plastic masses, etc. 37,143. December 9.

—— Manufacture of nitrogenous bodies. 37,144. December 9.

Hill, R. Manufacture of dimethylothiourea. 37,504. December 12.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of metal carbonyls. 36,961. December 8.

—— Simultaneous recovery of fatty acids and valuable salts. 36,962. December 8.

—— Isolation of fatty acids. 36,963. December 8.

—— Splitting, etc., hydrocarbons, etc. 36,964. December 8.

—— Manufacture of acetylene. 36,965. December 8.

—— Manufacture of pure rubber hydrocarbons. 36,996. December 8.

—— Manufacture of wetting, etc. agents. 37,125. December 9.

—— Manufacture of cellular building materials. 37,126. December 9.

—— Manufacture of aromatic hydrocarbons and acetylene. 37,127. December 9.

—— Purification of acetylene. 37,128. December 9.

—— Production of mottling, etc. in paper plastic masses, etc. 37,143. December 9.

—— Manufacture of nitrogenous bodies. 37,144. December 9.

—— Manufacture of anthraquinone compounds. 37,261. December 10.

—— Polymerisation of diolefines. 37,403. December 11.

—— Manufacture of condensation products of the anthraquinone series. 37,407. December 11.

I.G. Farbenindustrie Akt.-Ges. and Mond, A. L. Production of anhydrous hydrofluoric acid. 37,279. December 10.

I.G. Farbenindustrie Akt.-Ges. Manufacture of 1-phenyl-2-alkylaminoalcohols (1) hydroxylated in the phenyl nucleus. 36,999. December 8. (Germany, December 6, 1929.)

—— Manufacture of quinoline derivatives. 37,000. December 8. (Germany, December 6, 1929.)

—— Dyes. 37,003. December 8. (Germany, December 6, 1929.)

Imperial Chemical Industries, Ltd. Shot-gun cartridge cases. 37,396. December 11.

—— Shot-gun cartridge wads. 37,397. December 11.

—— Sulphonated linseed oil. 37,398. December 11.

Kali-Forschungs-Anstalt Ges. Production of potassium nitrate. 36,959. December 8. (Germany, December 11, 1929.)

—— Recovery of nitrogen oxides from nitrosyl chloride. 37,254. December 10. (Germany, May 20.)

Lengyel, M. Direct production of crude gas mixtures for ammonia synthesis. 37,424. December 11.

Mallinckrodt Chemical Works. Packaging ether, and product thereof. 37,015. December 8. (United States, December 20, 1929.)

New Jersey Zinc Co. Lithopone manufacture. 37,648. December 13. (United States, December 21, 1929.)

Newport Chemical Corporation. Wetting, etc., agents. 37,016. December 8. (United States, December 21, 1929.)

Robb, J. R. Reconditioning pipe lines, etc. 37,274. December 10.

Scottish Dyes, Ltd., Shaw, C. and Thomas, J. Production of vat dyestuffs, etc. 37,283. December 10.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID CHROMIC.—1s. per lb., less 2½% d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3¼d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised, 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included: £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¼d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—5d. to 7½d. per lb. Crude 60's 1s. 2d. to 1s. 6d. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 1d. to 2s. 3d. per gall. B.P., 4s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 3d. to 2s. 5d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 10d. to 2s. Dark, 1s. 5d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 7½d. to 8½d. per gall.; Standard Motor, 1s. 3d. to 1s. 4d. per gall.; 90%, 1s. 4½d. to 1s. 5½d. per gall.; Pure, 1s. 7½d. to 1s. 8½d. per gall. (The above prices were operative from October 21 last).

TOLUOLE.—90%, 1s. 8d. to 1s. 10d. per gall. Pure, 1s. 9½d. to 2s. 1d. per gall.

XYLOL.—1s. 4½d. to 1s. 9d. per gall. Pure, 1s. 7½d. to 1s. 11d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 5½d. to 6¾d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1¾d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 8¾d. per gall. Solvent, 90/160, 1s. 2½d. to 1s. 3d. per gall. Solvent, 95/160, 1s. 3½d. to 1s. 5d. per gall. Solvent 90/190, 11d. to 1s. 2d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £5 per ton. Whizzed, £4 to £5 per ton. Hot-pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 44s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8¼d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8¼d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.

DICHLORANILINE.—2s. 5d. per lb.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—7½d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 4d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. to £8 per ton. Grey, £14 to £15 per ton. Liquor, 9d. per gall.

ACETONE.—£74 to £75 per ton.

CHARCOAL.—£6 5s. to £8 3s. per ton, according to grade and locality.

IRON LIQUOR.—10d. to 1s. 2d. per gall.

RED LIQUOR.—8d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—2s. 11d. to 3s. 1d. per gall. Solvent, 4s. per gall.

WOOD TAR.—£4 5s. per ton.

BROWN SUGAR OF LEAD.—£37 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£6 to £7 10s. per ton, according to quality.

CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—3¼d. to 4 1/16 d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity. drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4¾d. to 5½d. per lb.; Dark, 4½d. to 5d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 6d.–7s. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£38 5s. per ton, for ½ ton lots, £37 5s. for 1 ton, smaller quantities £39 5s., delivered, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 2d. to 1s. 2½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 0½d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 9d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ARGENT. NITRAS, CRYSTALS.—1s. 1d. per oz.
ATROPHINE SULPHATE.—8s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BISMUTH CARBONATE.—7s. 6d. per lb.
BISMUTH CITRATE.—7s. 6d. per lb.
BISMUTH SALICYLATE.—7s. 3d. per lb.
BISMUTH SUBNITRATE.—6s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. per lb.
BISMUTH OXIDE.—9s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2d. per lb.; 6 W. Qts., 11½d. per lb.; 12 W. Qts', 10d. per lb.; 36 W. Qts., 9½d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 6d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. to 1s. 4d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
EMETINE HYDROCHLORIDE.—58s. 6d. per oz.
EMETINE BISMUTH IODIDE.—33s. per oz.
EPHEDRINE, PURE.—12s. 6d. to 13s. 6d. per oz.
EPHEDRINE HYDROCHLORIDE.—9s. 9d. to 10s. 6d. per oz.
EPHEDRINE SULPHATE.—9s. 9d. to 10s. 6d. per oz.
ERGOSTEROL.—2s. 6d. per gm.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—27s. 6d. per oz.
HYDRASTINE HYDROCHLORIDE.—90s. per oz. for small quantities.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; fo 128-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 2s. 2d. per lb., for 28-lb. lots. Green, 2s. 9d. per lb., list price. U.S.P., 3s. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt. according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. 3d. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. 3d. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
PARAFORMALDEHYDE.—1s. 8d. per lb.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
PILOCARPINE NITRATE.—10s. 6d. per oz.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—88s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 1s. 10d. to 2s. 3d. per lb.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
QUINOPHAN.—B.P.C., 14s. 6d. to 16s. 6d. per lb. for cwt. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—18s. 6d. per lb.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE.—B.P.C. 1911, 1s. 6d. to 1s. 11d. per lb. B.P.C. 1923, and U.S.P., 1s. 10d. to 2s. 3d. per lb.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—85s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 7s. 3d. to 8s. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—9s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—6s. 3d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 9d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—7s. 6d. per lb.
CITRAL.—7s. 6d. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—8s. 9d. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—10s. 9d. per lb.
LINALOL, EX BOIS DE ROSE.—6s. per lb. Ex Shui Oil, 6s. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—8s. 6d. per lb. Ex Shui Oil, 8s. 6d. per lb.
MUSK KETONE.—30s. per lb.
MUSK XYLOL.—6s. 3d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—42s. per lb.
SAFROL—1s. 6d. per lb.

(*Essential Oils on page 583.*)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co. Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, December 17, 1930.

THE holiday influence is at the time of writing making itself felt in the demand for chemicals, the bulk of the inquiry now being for 1931 delivery. There is little of outstanding importance to report, prices in the main continuing steady.

General Chemicals

ACETONE.—Spot prices are unchanged at £71 10s. to £80 per ton, according to quantity, with a fairly satisfactory demand.

ACID ACETIC.—The market is receiving a regular demand, with the prices steady at £36 5s. to £38 5s. per ton for technical 80% and £37 5s. to £39 5s. per ton for pure 80%.

ACID CITRIC.—The market has not shown any further weakness and is now tending to settle at about 1s. 2½d. to 1s. 3d. per lb., less 5%. Enquiry is still only for small quantities.

ACID FORMIC.—In fairly active request at about £38 per ton for 85%.

ACID LACTIC.—Unchanged at £41 to £42 per ton for 50% by weight pale quality and in steady demand.

ACID OXALIC.—Continues unchanged at £30 7s. 6d. to £32 per ton, according to quantity, and there is a regular demand.

ACID TARTARIC.—Maintained at 1s. to 1s. 1d. per lb., less 5%, and there is if anything a little better demand.

ALUMINA SULPHATE.—Has been in brisk demand mainly for forward delivery and continues firm at £7 15s. to £8 5s. per ton for the 17/18% iron free quality.

ARSENIC.—Unchanged at £19 to £19 10s. per ton, with a fairly good demand.

CREAM OF TARTAR.—In steady request, at the unchanged price of 88s. per cwt. ex warehouse London.

COPPER SULPHATE.—Prices are unchanged at about £22 to £22 10s. per ton, less 5%, free on rails London, and there is a steady demand.

FORMALDEHYDE.—Unaltered at about £32 per ton, ex warehouse London, with the demand fairly active.

LEAD ACETATE.—Unchanged at £34 15s. per ton for brown, and £35 15s. per ton for white.

LEAD NITRATE.—A small business is passing at about £29 10s. per ton.

LITHOPONE.—Quoted at £18 to £22 per ton, according to grade and quantity, with a fairly satisfactory demand.

POTASSIUM BICHROMATE.—Firm at 4¼d. per lb., with the usual discounts for contracts, and a fair amount of business has been booked for forward delivery.

POTASSIUM CARBONATE.—Steady at about £28 per ton for the 96/98% arsenic free quality.

PERMANGANATE OF POTASH NEEDLE CRYSTALS, B.P.—In good demand at the unchanged price of 5½d. per lb., at which figure the market is firm.

SODIUM BICHROMATE.—In active request for next year's delivery at 3½d. per lb., with the usual discounts for contracts.

CHLORATE OF SODA.—Quoted higher at about £25 per ton.

SODIUM HYPOSULPHITE.—Commercial crystals are quoted at about £8 10s. per ton, and photographic crystals at £14 5s. per ton, and there is a small trade being concluded.

SODIUM SULPHIDE.—Prices are unchanged at £10 5s. to £11 5s. per ton for solid, with broken material at £1 per ton extra, these prices being carriage paid, and there is a small trade passing.

TARTAR EMETIC.—Quiet at about 11d. per lb., with the demand being only for small lots.

ZINC SULPHATE.—Steady at about £11 to £11 10s. per ton.

Coal Tar Products

THE market for coal tar products remains quiet, and there is no change in prices to report from last week.

MOTOR BENZOL.—Quoted at about 1s. 5½d. to 1s. 6½d. per gallon f.o.r.

SOLVENT NAPHTHA.—Unchanged, at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Remains at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL.—Unchanged, at 3d. to 3½d. per gallon f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Quoted at 1s. 8d. per gallon for the 98/100% quality, and at 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Remain at £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78% quality.

PITCH.—Obtaining 37s. 6d. to 42s. 6d. per ton, f.o.b. East Coast port.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—During the week inquiries for sulphate of ammonia were few and the price remained unchanged at £7 to £7 5s. per ton, f.o.b. U.K. port, in single bags. *Home.*—Merchants are still refraining from covering their spring requirements, and some of them have a pessimistic outlook for the coming season's trade. Unless there is some upward turn in the price of agricultural products, it appears that there may be a considerable decline in home consumption this year. Producers are quoting £9 5s. per ton, delivered to farmers' nearest station, in 6-ton lots, with £9 8s. per ton for January delivery and £9 10s. per ton for the spring.

Nitrate of Soda.—New York reports that the market for this product displays unusual dullness even for th s period. Conditions on the Continent appear to be quiet, with buyers tending to hold off. Scale prices are being maintained in each country.

Latest Oil Prices

LONDON, December 17.—LINSEED OIL was steady at 5s. to 7s. 6d. per ton decline. Spot, nominal, December, £21 15s.; January, £20 10s.; January/April, £19 12s. 6d; May/August, £19 10s.; September/December, £20, naked. RAPE OIL was slow. Crude extracted, £30; technical refined, £31 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian, crude, £23; refined common edible, £28; deodorised, £30, naked, ex mill. TURPENTINE was quiet. American, spot, 34s.; January/April, 34s. 9d.; Russian, spot, 31s. 6d. per cwt.

HULL.—LINSEED OIL.—Spot, £20 15s.; December, £20 12s. 6d.; January/April, £20 5s.; May/August, £19 15s.; September/December, £20 5s. East Indian, spot, unquoted. Baltic, spot, £27 15s. per ton, naked. COTTON OIL.—Egyptian crude, spot, £22; edible refined, spot, £25; technical, spot, £25; deodorised, spot, £27 per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £24 10s. per ton, naked. GROUNDNUT OIL.—Crushed extracted, spot, £29 10s.; deodorised, spot, £33 10s. per ton. SOYA OIL.—Extracted and crushed, spot, £24 10s.; deodorised, spot, £28 per ton. RAPE OIL.—Crushed extracted, spot, £30; refined, spot, £32 per ton. CASTOR OIL.—Pharmaceutical, spot, 40s. 6d.; first, spot, 35s. 6d.; seconds, spot, 33s. 6d. per cwt.; April/December delivery, 1s. 6d. less. TURPENTINE.—Spot, 36s. 3d. per cwt., net cash terms, ex mill. COD OIL unaltered.

South Wales By-Products

With the holidays at hand there has been a sharp slackening-off in South Wales by-products activities. Pitch has not maintained its promise of a few weeks ago, but, with patent fuel exports going up, it is expected that the makers will come into the market immediately the Christmas break is over. There is a fair call for road tar round about 13s. per 40-gallon barrel delivered. Refined tars have also a steady, moderate call, with quotations for coke-oven and gasworks tar unchanged.

Scottish Coal Tar Products

ORDERS continue very scarce, and stocks in this area are increasing. Interest is centred chiefly on refined tars for delivery next season, and already some contracts have been placed at keen prices. Creosote and water white products are quieter.

Cresylic Acid.—The position remains easy. Pale, 99/100%, 1s. 7d. to 1s. 8d. per gallon; pale, 97/99%, 1s. 6d. to 1s. 7d. per gallon; dark, 97/99%, 1s. 5d. to 1s. 6d. per gallon; high boiling acid, 1s. 7d. to 1s. 9d. per gallon; all ex makers' works.

Carbolic Sixties.—Value is nominal at about 1s. 10d. per gallon for best grades.

Creosote Oil.—Fewer orders are being placed, but quotations are unchanged. Specification oil, 2½d. to 2¾d. per gallon; gas works ordinary, 3d. to 3¼d. per gallon; washed oil, 3d. to 3¼d. per gallon; all in bulk f.o.r.

Coal Tar Pitch.—Supplies are more plentiful, but business is dull. Quotations range from 42s. 6d. to 45s. per ton f.a.s. Glasgow for export, and about 45s. per ton f.o.r. works for home delivery.

Blast Furnace Pitch.—Trading is on a small scale and controlled prices are unchanged at 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Some forward business has been arranged and value is easier at 3d. per gallon f.o.r. makers' works in buyers' packages.

Blast Furnace Tar.—Without interest at 2¾d. per gallon.

Crude Naphtha.—Available supplies command about 4d. per gallon f.o.r. makers' works.

Water White Products.—Stocks are increasing and orders continue scarce. Motor benzol, 1s. 4d. to 1s. 4½d. per gallon; 90 160, solvent, 1s. 2d. to 1s. 3d. per gallon; 90/190, heavy solvent, 1s. to 1s. 0½d. per gallon; all f.o.r. in bulk quantities.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, December 16, 1930.

BUSINESS in the Scottish heavy chemical market has fallen off during the past week, principally due to the approach of the Christmas holidays and annual stocktaking. Prices still remain steady.

Industrial Chemicals

ACETONE.—B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered free Great Britain in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at the same price, viz.: 3¼d. per lb., ex store. On offer from the Continent at 3¼d. per lb., ex wharf.

ACID, SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11¾d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £31 per ton, ex wharf. On offer for shipment from China at about £29 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £21 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £22 5s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £10 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or at £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £33 per ton, ex store. Continental on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, carriage paid.

LEAD, ACETATE.—White crystals quoted round about £38 to £39 per ton ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE.—GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £25 per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid, buyer's station, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £9 15s. per ton, carriage paid, buyer's sidings, minimum six-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices, 55s. per ton, ex works; 57s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

(*Continued from page 581.*)

Prices of Essential Oils

BERGAMOT OIL.—8s. 9d. per lb.
BOURBON GERANIUM OIL.—16s. per lb.
CASSIA OIL, 80/85%.—4s. 3d. per lb.
CINNAMON OIL LEAF.—6s. 3d. per oz.
CITRONELLA OIL.—Java, 2s. 4d. per lb., c.i.f.
CLOVE OIL, 90/92%.—8s. 3d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 9s. 3d. per lb.
LEMON OIL.—4s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 9s. 3d. per lb.

Importance of Calcium Carbide in France

Growth in Production

THE production of calcium carbide in France increased in 1929 by 6,000 metric tons, reaching 91,000 metric tons, as against 85,000 metric tons in 1928. This increase is partly due to the development of the cyanamide industry, which grew from 55,000 metric tons in 1928 to 60,000 metric tons in 1929. Imports are small and in 1929 amounted to 112 metric tons, as against 480 metric tons in 1928, while exports reached 25,698 tons in 1929, compared to 22,503 tons in 1928.

The Société d'Electro-Chimie, d'Electro-Metallurgie et des Acieries Electriques d'Ugine, for some time past has been producing calcium carbide. In the recent annual report of the directors of this concern, it was stated that the importance of this product, and the competitive conditions existing on the French market, made necessary the modernisation of the company's plants, which are already producing more than 25,000 metric tons of calcium carbide annually. The necessary additions and transformations, however, will not be finished before the close of the year 1931.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, December 18, 1930.

Although up to the present there has been no general tapering off of business in the chemical market, complaints as to quieter conditions have been forthcoming here and there during the past week, although, to some extent, these have been counterbalanced by reports on this market as to pretty fair forward contract orders having been booked. There is no doubt, however, that during the next two weeks, at all events, trade will be on distinctly quiet lines, and no return to reasonably active conditions can be looked for until early next month.

Heavy Chemicals

A moderate inquiry is reported in the case of prussiate of soda, offers of which are maintained at from 4¾d. to 5¼d. per lb., according to quantity. There has been some contract buying of bichromate of soda at the higher rate of 3½d. per lb., less 1 to 2½ per cent. discount, according to quantity, for delivery over the coming year. Chlorate of soda is being quoted at the higher level of round £25 10s. per ton, although only a quiet business in this still seems to be done. Alkali is firm at about £6 per ton, with bicarbonate of soda in a similar position at £10 10s. With regard to phosphate of soda, buying interest in this material is on very moderate lines, but prices keep fairly steady at round £10 per ton for the dibasic quality. A quiet trade is being put through in the case of sulphide of sodium, offers of which range from £10 to £11 per ton for the 60/65 per cent. concentrated solid quality of British make, and about £9 2s. 6d. for the commercial material. Caustic soda is moving in fair quantities for the time of the year, and prices keep firm at from £12 15s. to £14 per ton, in contracts, and according to quality. Saltcake is not attracting a great deal of attention just now, but values are held at about £3 per ton. Hyposulphite of soda is in quiet demand, with offers of the photographic quality at about £15 per ton and of the commercial kind at £9 5s.

No more than a quiet call for caustic potash is reported, but at round £29 per ton the price position in this section is pretty well unchanged. Chlorate of potash is dearer at £27 10s. per ton, but inquiry is only very moderate at the moment. Bichromate of soda is quoted on the basis of 4¼d. per lb., less 1 to 2½ per cent. according to quantity, a quiet business being done. A moderate amount of interest is being shown in yellow prussiate of potash, value of which are firm at from 6¾d. to 7¼d. per lb., according to quantity. Carbonate of potash is fairly steady at about £25 per ton, but current demand for this material is on rather quiet lines. With regard to permanganate of potash, offers are still on the basis of about 5¼d. per lb. for the commercial quality and 5½d. for the B.P.

Arsenic continues firm at up to £19 10s. per ton at the mines for white powdered, Cornish makes, with offers not too plentiful. The fresh weakness in copper has not increased confidence in the price stability of sulphate of copper, values of which are uncertain, although nominally unchanged at about £21 per ton, f.o.b. There is a quiet trade passing in the case of the acetates of lime, with quotations much the same as at last report, at about £7 10s. per ton for the brown material and £14 10s. per ton for the grey. Lead acetate is attracting limited attention at round £34 per ton for brown and £35 for white, with nitrate in the neighbourhood of £29 per ton.

Acids and Tar Products

Among the acid products, citric acid is slow and on the easy side at about 1s. 3d. per lb., with tartaric acid fully maintained at up to 1s. 0¾d. per lb. Acetic acid is steady and in moderate request at about £37 per ton for the 80 per cent. commercial grade, and £51 per ton for the glacial. Oxalic acid is slow, but offers are still at round £1 12s. per cwt., ex store.

The by-products market this week has been rather subdued, with pitch only moderately active at from 40s. to 45s. per ton, f.o.b., and creosote oil in quietly steady request at from 3¼d. to 4¼d. per gallon, naked, according to grade. Carbolic acid is weak and inactive at about 5½d. per lb. f.o.b. for crystals, and 1s. 4d. per gallon for 60's crude material. Solvent naphtha is fairly steady at round 1s. 2¾d. per gallon, naked.

Company News

W. and T. Avery.—An interim dividend of 5 per cent., less tax, is payable on January 1 on the ordinary shares.

Boots' Pure Drug Co.—A quarterly dividend at the rate of 24 per cent. per annum, less tax, is announced on the ordinary shares, payable on January 1.

Cape Asbestos Co., Ltd.—The directors have announced that the consideration of a dividend on the 100,000 £1 ordinary shares for 1930 is deferred until the accounts for the year have been completed. At this time last year an interim of 5 per cent. was declared on the ordinary, together with an equivalent interim on the 100,000 £1 five per cent. cumulative participating preference shares. These payments were followed by finals of 10 per cent., making 15 per cent. on the ordinary and 20 per cent. on the preference, as in 1928.

Sulphide Corporation.—The operations for the year to June 30 last resulted in a net profit of £72,593, which compares with £213,228 for the previous year, a decrease of £140,635. It is recommended that after appropriating £7,200 to "reserve for contingencies" and £25,000 to "taxation reserve," a dividend of 5 per cent., absorbing £30,000, be paid on the preference shares, and that the balance of £10,393 be carried to the accumulated profits account, which now stands at £170,120. Last year 15 per cent. was paid on the ordinary shares.

New Tamarugal Nitrate Co., Ltd.—The profit and loss account shows a gross profit for the eleven months to June 30 last of £75,858, against £142,415 for the previous period of twelve months. After deducting depreciation, office and other expenses, there is £9,004, which with the balance brought forward, makes £128,707. Interest of 4 per cent. on Income Bonds for the period ended July 31, 1930, and amortisation of Income Bonds (5 per cent. of total issue), reduces this figure to £121,746, which the local board proposes carrying forward.

Aguas Blancas Nitrate Co. (1928), Ltd.—For the year to June 30 last, the report shows a loss of £35,595, which increases the debit balance at profit and loss account to £83,975. In their report the directors state that, subject to the ratification of the shareholders, and with the approval of the debenture-holders' trustees, a provisional agreement has been arranged for the sale of the company's properties, the terms of which will be submitted at the earliest possible moment. This sale was foreshadowed by a circular, issued in June, in connection with the formation of the Compañia de Salitre de Chile ("Cosach"), of which the company is to be a member.

Tariff Changes

Australia.—The following decisions have recently been reached by the Commonwealth Department of Trade and Customs respecting the application of the Customs (British Preferential) tariff: Terebine extract, Tariff No. 232 (A), 3s. 6d. per 5¼ lb., or 35 per cent. *ad val.*, whichever is higher; synthetic carbon, in powder form, carbon in compressed block or rod form, and natural carbon, Tariff No. 415 (A), free; natural and synthetic cryolite, free; carbonate of potash for all purposes, Tariff No. 281 (K) free.

Germany.—As from November 27 the following reductions in the Customs tariff (most-favoured-nation-treatment) are in force:—Duty on chemical wood pulp (cellulose) is now 1·50 Rm. per 100 kilogs. (instead of 1·75); chemical wood pulp containing 50 per cent. of water or more, 1 Rm. (instead of 1·15); chemical or mechanical wood pulp board, 2·25 Rm. (2·50).

Sudan.—The importation, distribution, sale and possession of the following liquors is absolutely prohibited in the Sudan:—(*a*) Trade spirits of every kind and beverages mixed with these spirits. (*b*) Injurious spirits, *i.e.*, distilled liquors containing essentials oils or chemical products which are recognised as injurious to health, such as thujone, star anise, benzoic aldehyde, salicylic esters, hyssop, absinthe and similar substances, unless they have been denatured.

Turkey.—The importation of saccharine is prohibited, except for medicinal and scientific purposes.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

HEYWOOD, Francis Isadore, Watergate House, 15, York Buildings, Adelphi, W.C., iron ore importer. (C.C., 20/12/30.) £30 8s. 1d. October 31.

Receiverships

BIOZONE, LTD. (R., 20/12/30.) A. H. Howard, of 410, St. John Street, E.C., was appointed Receiver and Manager on December 2, 1930, under powers contained in first mortgage debentures dated September 8, 1926.

LOCKWOOD (J. R.) AND CO., LTD. (R., 20/12/30.) A. G. White, of 14, Old Jewry Chambers, E.C., was appointed Receiver and Manager on December 4, 1930, under powers contained in debenture dated June 2, 1930.

Declaration of Solvency

[*Registered under Section 230 of the Companies Act, 1929. It must be understood that (a) a company which has filed a Declaration of Solvency may be proposing to wind up with a view to reconstruction, and (b) it does not necessarily follow that a company which has filed such declaration will actually pass a resolution to wind up.*]

YEASTPIRIN, LTD., 123, Coldharbour Lane, S.E.5, manufacturing and general chemists and druggists. Declaration of solvency filed December 10, 1930.

London Gazette, &c.

Company Winding Up

SABULITE (GREAT BRITAIN), LTD. (C.W.U., 20/12/30.) Winding-up order made, December 15.

Companies Winding Up Voluntarily

ANILINE STORAGE CO., LTD. (C.W.U.V., 20/12/30.) By special resolution December 2. H. H. Horton, of 46, St. Mary Axe, E.C.3, appointed as liquidator.

OILFIELDS, LTD. (C.W.U.V., 20/12/30.) By special resolution of December 10th, for purpose of reconstruction. G. Wyatt, of 14, Union Court, E.C. (the secretary of the company), appointed as liquidator.

PLATINUM AREAS, LTD. (C.W.U.V., 20/12/30.) By special resolution December 10, for purpose of reconstruction. G. Wyatt, of 14, Union Court, E.C., (the secretary of the company) appointed as liquidator.

VEGETABLE OIL MACHINERY SYNDICATE, LTD. (C.W.U.V., 20/12/30.) By reason of its liabilities, December 10. J. S. Hamer, A.C.A., of 236, Corn Exchange Buildings, Manchester, appointed as liquidator.

Bankruptcy Information

MORRISON, Charles, 3, Billiter Square Buildings, Billiter Square, London, E.C., paint manufacturer. (R.O., 20/12/30.) Receiving order, December 12, debtor's petition. First meeting, December 23, 11.30 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2. Public examination, February 13, 1931, 11 a.m., Bankruptcy Buildings, Carey Street, London W.C.2.

Partnership Dissolved

THOMAS NIGHTINGALE AND CO. (Norman Victor LUNDIE and Thomas Alexander NETTLETON), manufacturing chemists, 24, Brighton Street, Seacombe, by mutual consent, November 13, 1930. Debts received and paid by T. A. Nettleton.

New Companies Registered

ENGLISH PLASTICS, LTD., 137, Victoria Street, London, S.W.1. Registered December 12. Nominal capital, £15,750 in 15,000 8 per cent. cumulative preference shares of £1 and 15,000 ordinary shares of 1s. each. Manufacturers of and dealers in synthetic resin products and urea powders of all kinds, varnishes, paints, celluloid products and pigments, colour grinders, oil and colour men, drysalters, etc. Provisional directors: R. D. Hyem, 5, Grays Inn Square, London, W.C.1; A. Urry.

CHARLES GERARD AND CO., LTD., 12A, John Gate, Bradford. Registered December 10. Nominal capital, £2,000 in £1 shares. Manufacturers of and dealers in chemicals, industrial and other preparations and articles, colours, dyes, dyewares, petroleum, naphtha, spirits, scientific and photographic instruments and appliances, etc.

SCIENTIFIC CLEANSERS, LTD. Registered December 13. Nominal capital, £100 in £1 shares. Manufacturers of and dealers in detergents and cleansing preparations of all kinds, chemical manures, fertilisers, insecticides, germicides and fungicides, oil, grease and fat extractors and refiners, etc. Directors: A. E. Norris, 18, Radnor Park Road, Folkestone; Laurie B. Parsons, 41, Southville, South Lambeth, London, S.W.8.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to January 3, 1931.

GLYCO-IZAL.

516,485. Class 3. Chemical substances prepared for use in medicine and pharmacy. Newton, Chambers and Co., Ltd., Thorncliffe Ironworks and Collieries, near Sheffield; manufacturers.—October 1, 1930. To be associated with No. 171,812 (788) and others.

GLYPSOL.

516,627. Class 4. Raw, or partly prepared, vegetable, animal and mineral substances used in manufactures, but not including liquids for use in the manufacture and thinning of printing ink, and not including any goods of a like kind to these excluded goods. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley; Manchester; manufacturers.—October 4, 1930.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

NORWAY.—The Bergen Town Council have appointed a committee for the purpose of considering the question of the erection of: (1) A calcium hydrate dosing plant for the counteraction of rust formation in the town water-supply system; (2) a filter plant for the cleansing of the town drinking water; (3) a sterilising plant to insure the town drinking water against dangerous bacteria—a chlorination plant. —(Ref. A.X. 10,565.)

UNITED KINGDOM.—Tenders are invited from time to time for Army Contracts for the supply of chemicals and gases, medical supplies, oils and spirits, paints and varnishes. All applications should be in writing, and should be addressed to the Director of Army Contracts, Caxton House (West), Tothill Street, Westminster, London, S.W.1. No application is necessary from firms whose names are already on the War Office lists, unless they have extended the range of their manufactures.